SCOTTISH YOUNG PEOPLE'S POST-SCHOOL DESTINATIONS 1977-83

Thesis submitted by

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I CERTIFY THAT THIS THESIS IS MY OWN COMPOSITION

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ABSTRACT

In this Thesis data from The Scottish Education Data Archive, relating to the 1977, 1979, 1981 and 1983 Scottish School Leavers Surveys, are used in order to examine Scottish young people's post-school destinations. The major change, over the period 1977-83, was a dramatic decline in the proportion entering employment. Most of the material in the Thesis is directly concerned with school leavers' employment.

In the introductory chapter, the scene is set for the rest of the Thesis and three proposed explanations of the decline in youth employment are critically reviewed; they are: the real wage, the demand deficiency and the structural hypotheses. The introductory chapter concludes with a discussion of the Scottish Education Data Archive. The second and third chapters contain an examination of the changes in Scottish school leavers' industrial and occupational distributions of employment, respectively. The fourth chapter examines the role played by changes in the industrial distribution of school leavers' employment in determining the changes in their occupational distribution of employment. The fifth chapter examines the extent to which the decline in school leavers' employment was disproportionately large, compared to the decline in all ages' employment, and the extent to which this resulted from either structural change or school leavers' particularly vulnerable labour market position. The sixth chapter examines the question of whether the bottom has dropped out of the market for school leavers' labour. The seventh chapter contains an econometric examination of the role played by a measure of school leaver's employment prospects, amongst other factors, in influencing their decisions as to whether to continue into full-time tertiary education.

Contents

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CHAPTER 1

INTRODUCTION

1.1. In the Beginning

1.1.1. Preface

This Thesis examines changes in the post-school destinations of Scottish young people over the period 1977 to 1983. The main interest lies in their labour market destinations and, in particular, their employment, and hence their industries and occupations of employment. However, the Thesis also contains an examination of the rise in Scottish school leavers' non-employment and the determinants of their decisions whether or not to continue into full-time tertiary education at the end of their secondary education.

The material in this Thesis is based upon analysis of the data contained in The Scottish Education Data Archive (See Section 1.7 below). The data contained in The Scottish Education Data Archive (SEDA) are drawn from the results of a biennial postal survey of a representative sample of Scottish school leavers conducted by The Centre for Educational Sociology (CES) at the University of Edinburgh. This Thesis draws on the results of the 1977, 1979, 1981 and 1983 surveys. The choice of the period covered by this Thesis was dictated by the nature of the SEDA data. The first Scottish School Leavers survey (SSLS) was conducted in 1977 and the 1983 survey was the latest survey for which results were available when the bulk of the analysis contained in this Thesis was undertaken.

1.1.2. An Overview of the Contents of the Thesis

Each chapter in this Thesis is constructed around a central set of questions. These central sets of questions are outlined below and their genesis is discussed thereafter. The central sets of questions are:

1. What were the major changes in Scottish young people's post-school destinations over the period 1977 to 1983? Why did young peoples' employment decline? (This Chapter).

2. In which industries did Scottish school leavers find work, how did their industrial distribution of employment change, and what did the industrial pattern of their employment change look like, between 1977 and 1983? (Chapter Two).

3. In which occupations did Scottish school leavers work, how did the occupational distribution of their employment change, what did the occupational pattern of their employment change look like, and did the occupational gender segregation of their employment change between 1977 and 1983? (Chapter Three)

4. What role did changes in the industrial distribution of Scottish school leavers' employment play in determining the changes in their occupational distribution of employment? (Chapter Four)

5. To what extent can the decline in Scottish school leavers' employment over the sub-periods 1977 to 1981, and, 1979 to 1983 be attributed to the decline in all ages' employment in Scotland, to what extent can it be attributed to structural factors and, finally, to what extent can it be attributed to the peculiar vulnerability of their employment in periods of high unemployment? Also, how similar were Scottish all ages' and school leavers' industrial distributions of employment in 1977, 1979, 1981 and 1983? (Chapter Five)

6. Has the bottom dropped out of the market for Scottish school leavers' labour? That is, did the changes in the levels of school leavers'

employment and supply of labour to the market combine with changes in employer's hiring standards and changes in school leaver's educational attainment so as to bring about a very large increase in unqualified and less qualified school leavers' unemployment (whilst leaving their well qualified counterparts' unemployment little changed)? (Chapter Six)

7. What factors determined whether Scottish school leavers chose to continue in full-time tertiary education at the end of their secondary schooling and did their employment prospects play a role in determining their decisions? (Chapter Seven)

Two considerations served to limit the scope of the questions considered. Firstly, the nature of the SEDA. Until 1983, no questions on wages, for those school leavers in employment, or expected and reservation wages, for school leavers without a job, were included in the questionnaires sent by the CES to school leavers. In 1983, a twenty per cent sub-sample of school leavers were asked such questions. The lack of wage data in three of the four surveys and in eighty per cent of the fourth survey, effectively excluded the investigation of questions concerning school leavers' wages.[1]

Secondly, it was decided not to consider any questions concerned with state schemes for the young unemployed. (See Appendix 1.1 for details of such schemes.) There were two main reasons for this. Firstly, The Manpower Services Commission (MSC), which is, and was, responsible for monitoring such schemes, has commissioned many studies of young peoples' experiences of such schemes; so this area has already been extensively examined elsewhere.[2] Secondly, the need to place a limit on the extent of the Thesis was also an important consideration.

Turning to the genesis of the seven sets of questions listed above. The first set of questions was prompted by the observation (see Section 1.2 of this Chapter) that the proportion of school leavers entering employment decreased dramatically after 1979. Furthermore, even prior to 1979, Scottish young people were experiencing high rates of unemployment. The obvious question was what was the cause? This question has spawned a number of econometric studies and has been the subject of a lively debate in the literature. Since the decline in the proportion of school leavers going into employment was the single most important change in Scottish young people's post-school destinations, over the period 1977 to 1983, and, since much of the material in this Thesis is concerned with examining aspects of the decline in school leavers' employment, a review of this literature will provide useful background material.

The second and third sets of questions were principally prompted by the fact that little work previously existed on the industrial and occupational distributions of young peoples', let alone school leavers', employment. There was an obvious need to fill this gap and the SEDA contained the necessary data.

The fourth set of questions arose out of the analysis of the changes in Scottish school leavers' occupational distribution of employment. Quite often it appeared that occupational trends were reflections of underlying industrial trends. So it was decided to examine the part played by school leavers' industrial trends in determining their occupational trends.

The fifth set of questions arose out of a concern in the literature relating to the decline in young peoples' employment as to the extent to which this decline was attributable to: the decline in all ages' total employment, structural trends destroying jobs previously occupied by young people, and, finally, the

peculiar vulnerability of young peoples' employment in a time of high unemployment.[3] Furthermore, since other studies had been concerned with whether, to some extent, young people are excluded, i.e. under-represented compared to all ages, in some industrial categories and over-represented in others (Jolly *et al*, 1980; Ashton and Maguire, 1982) it was decided to look at this issue as well.

The sixth set of questions arose from a debate in the literature concerned with the relationship between young people's educational attainment and the decline in their employment prospects as to the extent to which long term changes in the occupational structure of employment had, in recent years, destroyed the unskilled and semi-skilled manual and clerical jobs previously filled by unqualified and less qualified young people, and had, therefore, caused an irreversible decline in their employment prospects, whilst the market for well qualified young peoples' labour had remained relatively buoyant.[4]

The final set of questions was prompted by the observation that, over the period 1977 to 1983, the proportion of Scottish school leavers continuing into full-time tertiary education had increased whilst their employment prospects had declined. The obvious question was: were the two linked?

1.1.3. The Rest of This Chapter

The general outline of the rest of this Chapter is as follows. Section 1.2 helps to set the scene for the rest of the Thesis by examining the changes in Scottish young people's post-school destinations over the period 1977 to 1983. Section 1.3 contains an account of the demand deficiency explanation of the decline in young peoples' employment. Section 1.4 contains an account of the relative pay explanation of the decline in young peoples' employment. Section 1.5 contains an account of the structural explanation of the decline in young

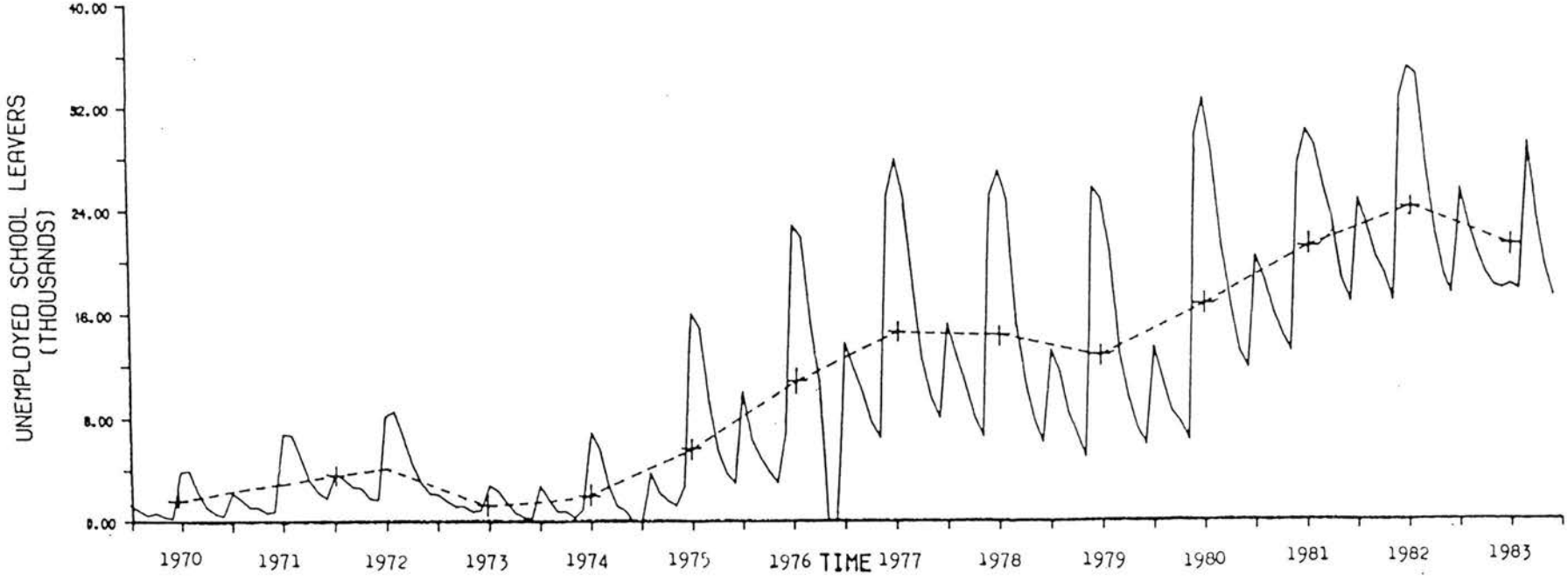
peoples' employment. Section 1.6 contains some brief conclusions concerning the material contained in the previous three sections. Section 1.7 provides a detailed description of The Scottish School Leavers Surveys of 1977, 1979, 1981 and 1983,. Finally, Section 1.8 contains concluding remarks.

1.2. Setting The Scene: The Changes in Scottish Young People's Post-School Destinations 1977-83

Figure 1.1 shows the number of unemployed school leavers in Scotland in every month between January 1970 and December 1983, with the exceptions of a couple of months in late 1976 when industrial action prevented the publication of figures. The Figure also shows the average monthly number of unemployed Scottish school leavers in each year.[5] Two things stand out from Figure 1.1, firstly, school leaver unemployment is seen to be highly seasonal, having a large peak in the Summer of each year, when the majority of pupils leave, and a smaller peak in mid-Winter, relating to Christmas leavers. School leaver unemployment tends to be at its annual low in the late Spring. Secondly, Scottish school leavers' unemployment tended to increase from 1975 onwards. It increased till 1977, declined slightly between 1977 and 1979, increased steeply after 1979 until 1982, and fell in 1983. So, the late 1970's and early 1980's saw a steep rise in Scottish school leavers' unemployment.

The rise in Scottish school leavers' unemployment would have been much greater if it had not been for the rise in the number of school leavers entering State schemes for the young unemployed. Figure 1.2 shows the number of people on schemes for the young unemployed in Scotland from June 1976 to December 1983.[6] It can be seen from Figure 1.2 that the number of people on such schemes rose steadily throughout the late 1970's, apart from late 1979 when there was a slight dip, and then accelerated in the early 1980's. This increase in the number of young people on such schemes was a reflection of

FIGURE 1.1: THE NUMBER OF UNEMPLOYED SCHOOL LEAVERS IN SCOTLAND, 1970(1)-1983(12)



Note: Industrial action affected the figures for two months in late 1976.

Sources: Table 2.3 of "The Employment Gazette", various issues.

Figure 1.2: The Number of Persons on Schemes for The Young Unemployed, Scotland, 1976 to 1983.

Sources: Scottish Economic Bulletin, No 20, Spring 1980, Table 11; Scottish Economic Bulletin, No 28, December 1983, p27; Department of Employment Press Notice (Scotland), 2nd February 1984.

both increasing youth joblessness and increasing State intervention in the youth labour market. So, Figures 1.1 and 1.2 indicate two main developments in the market for school leavers' labour during the period covered by this Thesis: firstly, an increase in school leavers' joblessness, and, secondly, large scale State intervention as a response.

So far nothing has been said of school leavers' employment, even though changes in school leavers' employment lay behind the two developments noted above. This is where the SEDA data set comes into its own, since there is a deficiency of official data. Table 1.1 and Figure 1.3, both based on SEDA data, show the percentage of each survey's sample going into five post-school destinations, i.e. employment, unemployment, participation on schemes for the young unemployed, continued full-time tertiary education, and, a residual category, for each gender separately. The data used in constructing Table 1.1 and Figure 1.3 have been weighted in order to take into account dis-proportionate stratification and known non-response associated with respondent's gender and educational attainment. It is also restricted to school leavers from state sector schools in Strathclyde, Lothian, Tayside and Fife for reasons which are explained in sub-section 2.4.2.

From Table 1.1 and Figure 1.3 it can be seen that the main change in young people's post-school destinations was that both genders suffered a dramatic decline in the proportion going into employment between 1979 and 1981, and that this decline continued between 1981 and 1983. In 1983, the proportion of males reporting that they were in the labour market but not in employment was nearly as large as the proportion reporting that they were in employment (37 per cent and 38 per cent respectively). In the case of females, in 1983 the percentage in the labour market and not in employment exceeded the percentage in employment (33.3 per cent and 33.0 per cent respectively). In

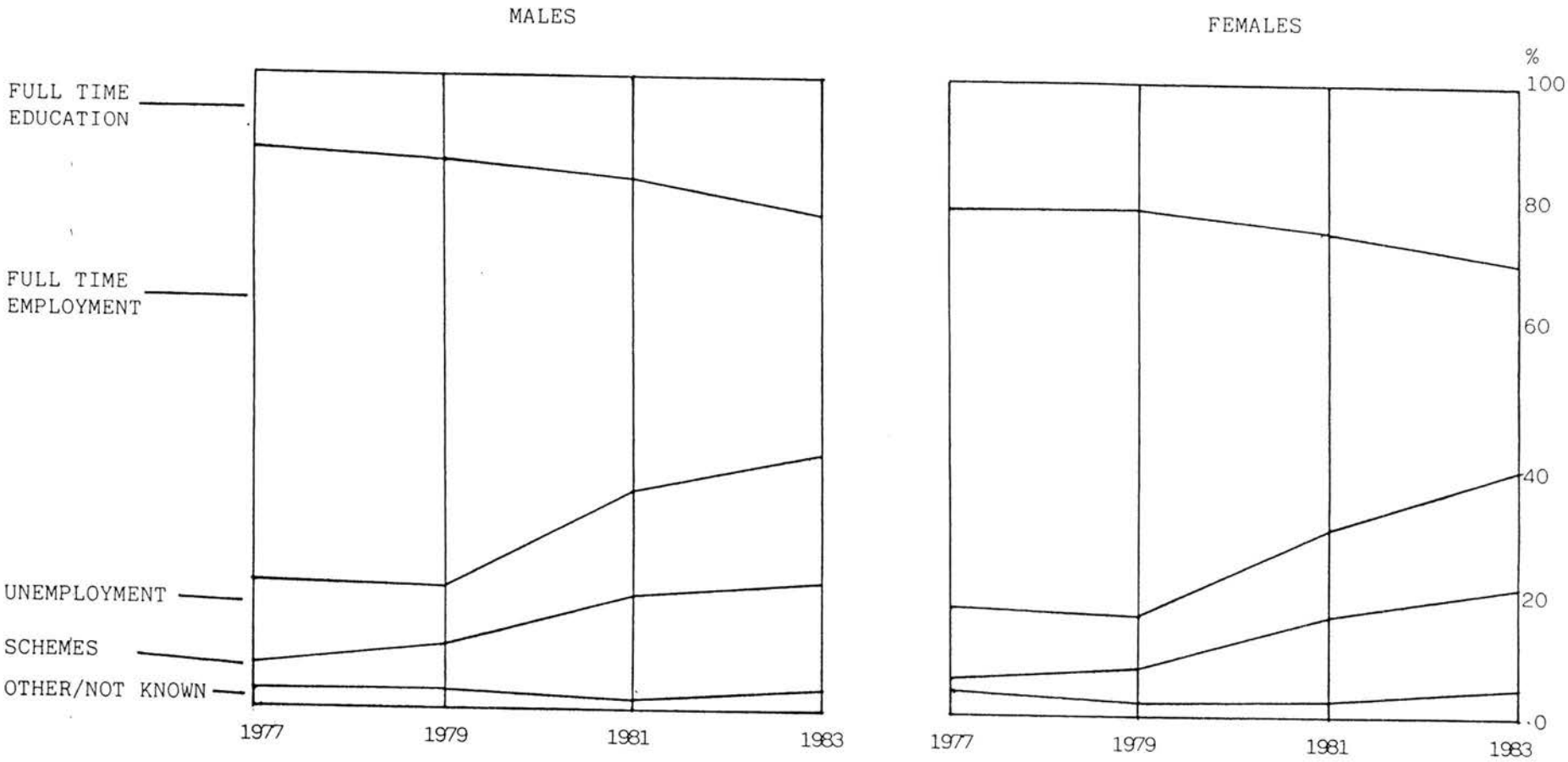
Table 1.1

The destinations of school leavers when surveyed, 1977, 1979, 1981, 1983

Year of leaving school	1975/76		1977/78		1979/80		1981/82	
Year of survey	1977		1979		1981		1983	
	M	F	M	F	M	F	M	F
Full-time education	12.3	20.4	13.6	20.1	16.4	23.5	22.1	28.5
Full-time employment	68.0	62.5	67.6	64.1	49.3	47.1	37.9	33.0
Unemployment	13.1	10.8	9.0	8.2	16.5	13.3	19.7	17.6
Schemes	3.7	2.3	7.1	5.2	16.1	13.3	16.9	15.7
Others/not known	3.0	3.9	2.7	2.4	1.7	2.8	3.4	5.2
Unweighted N's	3419	3527	3232	3405	7535	8473	2548	2471

Source: SEDA 1977, 1979, 1981, 1983

FIGURE 1.3: THE DESTINATION OF SCHOOL LEAVERS WHEN SURVEYED, 1977, 1979, 1981, 1983



SOURCE: SEDA

fact, over the period 1977-83, both genders saw the percentage recorded as in employment fall by about 30 percentage points, from 68.0 to 37.9 per cent in the case of males, and from 62.5 to 33.0 per cent in the case of females. The obverse of the decline in school leavers' employment, over the period 1977-83, was the increase in the percentage of school leavers reporting themselves as being either unemployed or on schemes for the young unemployed. The most dramatic increase in the relative importance of these two destinations took place between 1979 and 1981, though the trend continued to 1983.

It can also be seen from Table 1.1 and Figure 1.3 that female school leavers displayed a greater propensity to continue in full-time tertiary education than males. A trend over the period 1977-83, for both genders, was for the percentage continuing in full-time tertiary education to increase. For males, this trend was evident over the entire period 1977 to 1983, though it accelerated between 1981 and 1983. For females, the trend began in 1979 and, yet again, accelerated between 1981 and 1983. This increased participation in full-time education may have represented a form of the "discouraged worker" effect (Mincer, 1966). That is, by lowering the potential rewards to entering the labour market and reducing the opportunity cost of continued full-time tertiary education, the decline in school leavers' employment prospects may have increased the relative attractiveness of continued full-time tertiary education. The coincidence of the timing of the two trends suggests that they may indeed be linked.

In conclusion, it appears that the most dramatic change in Scottish young people's post-school destinations was the decline in the proportion going into employment after 1979, and the concomitant increase in the proportion going into unemployment or on to schemes. Another change was the increase in the proportion continuing into full-time tertiary education.

1.3. Why Did Scottish School Leavers' Employment Decline?: The Demand Deficiency Explanation

1.3.1. Introduction

The aim in this and the following two sections is to provide an account of three proposed explanations of the decline in youth employment. These three proposed explanations are: the demand deficiency, the relative pay and the structural explanations. The discussion commences with an account of the demand deficiency explanation.

According to the demand deficiency explanation (Main and Raffe, 1983a; Raffe, 1984a,b; Main, 1986) the decline in young peoples' employment resulted from the fact that their employment is peculiarly vulnerable to downturns in economic activity. It is argued that the recession that started in 1979 caused both all ages' and young peoples' employment to decline, but that the decline in young peoples' employment was a magnified version of the decline in all ages' employment. The question then arises as to how one can explain the disproportionate sensitivity of young peoples' and, in particular, school leavers' employment to downturns in economic activity.[7] The question has two parts, firstly, why firms chose to use the suspension of recruitment as the principal means of adjusting their work-forces to their lower, desired size in response to a decline in sales, and, secondly, why firms may have, in recent years, switched their hiring away from school leavers towards older workers in response to the increase in all ages' unemployment.

1.3.2. The Implications of the Fixed Costs of Labour for School Leavers' Employment

Starting with the reasons why firms might choose to use the suspension of recruitment as the principle means of reducing their work-forces, this question

can be answered in terms of the difference between the fixed costs associated with the hiring and the firing of labour. Since the pioneering work of Oi (1962) and Becker (1964) it has been explicitly recognised by economists that labour cannot be regarded either as a fully variable factor of production, as it is assumed to be in standard neoclassical theory, or as a fully fixed factor of production. Instead, it is now recognised that labour is a partly fixed or quasi-fixed factor of production (Oi, 1962). This quasi-fixity derives from the fact that certain fixed costs are attached to the employment of labour.

The fixed costs of labour, or non-wage labour costs as Hart (1984a) calls them, are defined by Hart (1984a) as:

> "those categories of the firm's total labour costs that comprise other than direct remuneration. They include fringe benefit payments, obligatory social welfare contributions, expenditure on recruitment and training as well as many other special cost items" (Hart, 1984, p.1).

The fixed costs of labour are so-called because they vary with the number of workers employed but not with the utilisation of worker's labour.

The fixed costs of labour can be divided into four types, namely, recruitment costs, training costs, employment costs, and, finally, severance costs. Recruitment costs are those costs that firms incur when they take on new workers, they consist of such items as the costs associated with screening workers, e.g. interview costs, and advertising vacancies. Training costs are those costs that firms incur when they invest in the training of their workers with the aim of increasing their productivity; they include: the cost of lost production, tuition costs, the cost of supervision, the cost of materials, etc. Employment costs are those costs incurred by firms simply as a result of their retaining their existing workers; they include such items as: pension contributions (see Rose, 1983) holiday entitlements, subsidised canteens, subsidised travel, company cars, subsidised social facilities, statutory sick pay,

employee insurance, personnel management costs, etc. The final category of fixed costs, severance costs, are those costs incurred by firms when they decide to make redundant, or sack, some or all of their workers; they include: the payment of statutory redundancy payments, possible payments for unfair dismissal, penalty clauses in worker's contracts of employment, "golden farewells", extra redundancy payments negotiated by unions, loss of remaining worker's goodwill and any disruption caused to production (Jolly *et al*, 1984).

The fixed costs of labour have important implications for the way in which firms adjust their work-forces in response to a decline in their sales. When changing the size of their work-forces, firms incur adjustment costs, which are the recruitment, initial training and severance costs discussed above. If a firm wants to reduce the size of its work-force, in response to a decline in its sales, the best policy, from the point of view of minimising adjustment costs, is that of reducing or halting recruitment, because reducing recruitment actually saves money by eliminating recruitment and initial training costs. Given that workers are also continually leaving firms via quits and retirement, this policy of drastically reducing recruitment will eventually reduce firm's work-forces to their new, lower desired levels via "natural wastage"; and without the need to incur severance costs and without upsetting the remaining work-force.

Evidence of the use of a reduction in recruitment by firms as a means of reducing their work-forces is contained in Figures 1.4 and 1.5. Figure 1.4 shows the engagement (hiring) and discharge (firing and quit) rates for manufacturing industries, in Great Britain, between 1974 and 1985. Figure 1.5 shows the total number of vacancies notified to Job Centres, in Great Britain, between 1980 and early 1986. It can be seen from Figure 1.4 that in the manufacturing industries, at least, the decline in total employment was mainly achieved by a decline in engagements, i.e. recruitment, rather than by a rise in

Figure 1.4

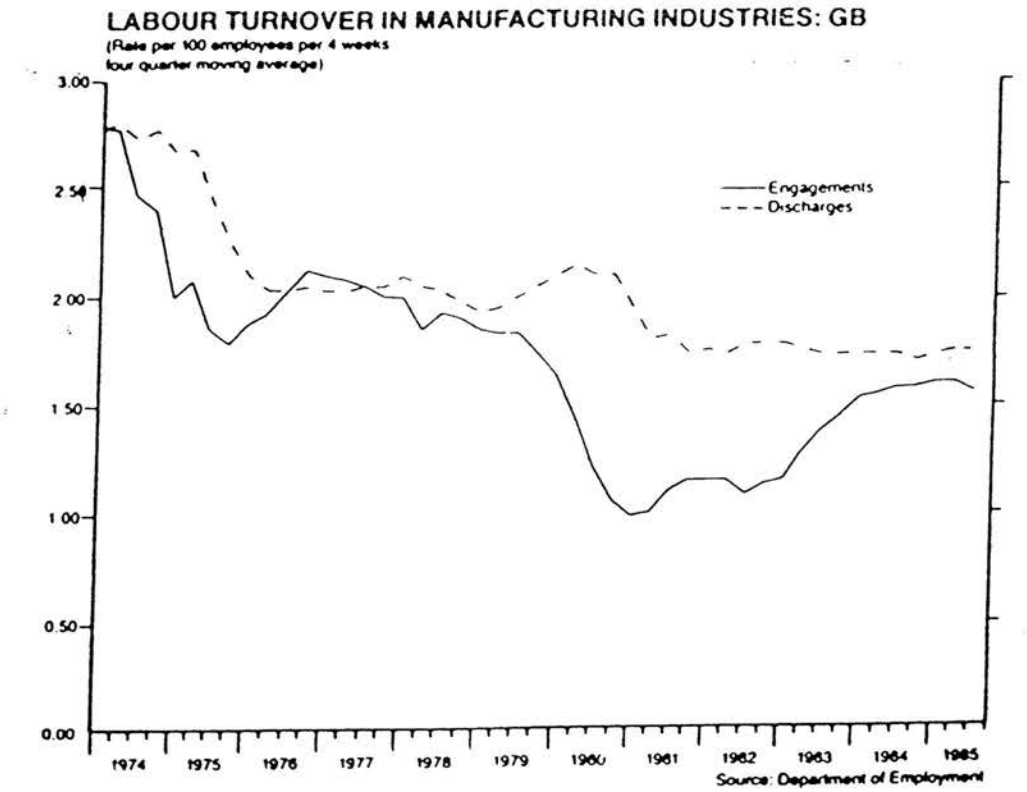
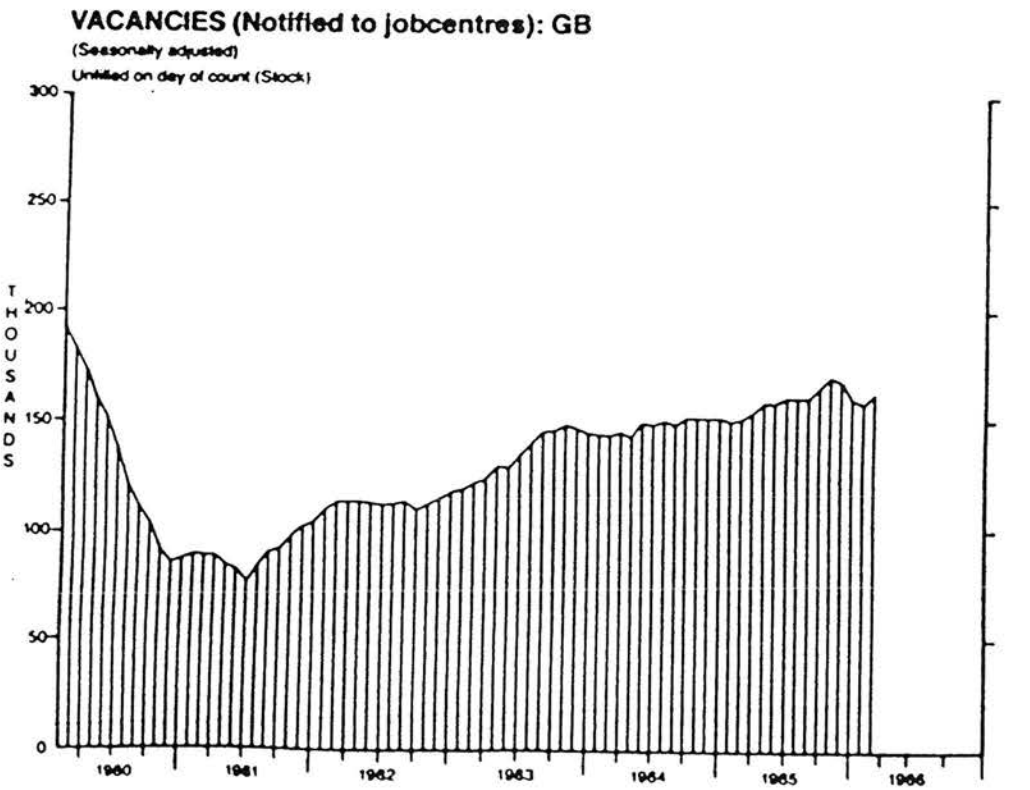


Figure 1.5



Source: MSC Labour Market Quarterly Report, February 1986, Graphs 4 & 5

discharges. It can be seen from Figure 1.5 that there was a large decline in notified vacancies during 1980 and that by 1986 vacancies had still not achieved the level recorded in the first quarter of 1980.

The above described decline in recruitment would have been expected to have affected school leavers more than older workers because school leavers are labour market entrants seeking jobs, whereas the majority of older workers would already be in a job. Older workers did suffer as a result of the increase in discharges that accompanied the decline in firm's recruitment, however, there are reasons to believe that school leavers would have been at a disadvantage, compared to older workers, when firms had to decide whom to discharge. This is because the severance costs associated with discharging school leavers can reasonably be expected to be lower than those associated with discharging older workers, on average.

There are a number of reasons for supposing that school leavers' severance costs will be lower, on average, than older workers'. Firstly, redundancy payments and payments for unfair dismissal are both positively related to age; therefore, they are lower for school leavers than for older workers (see Appendix 1.2). This tendency is reinforced by the fact that such payments are based on earnings, and that young peoples' average earnings are lower than adults' (see Wells, 1983; for evidence). Secondly, redundancy payments, unfair dismissal payments, loss of remaining worker's good-will, training costs etc are all related to tenure on the job.

The loss of worker's good-will will be costly to firms since it will entail less flexibility in production, e.g. working to rule by workers, perhaps a diminution of the training provided by existing workers to new entrants (Williamson *et al.*, 1975), etc. The extent of this loss of worker's good-will will be related to job

tenure because of conventions such as the "last in, first out" rule, whereby those most recently hired are expected to bear the brunt of discharges. To the extent that "last in, first out" rules are seen as being fair by workers, the firing of school leavers will cause a smaller loss of worker's goodwill than the firing of older workers.

Since a higher proportion of school leavers, than older workers, can be expected to be in the process of training, the costs arising from disruptions to production caused by the discharge of school leavers can be expected to be lower than those for older workers, since school leavers will be contributing less to current output than older workers. Training expenditures will also be reduced.

So, the fixed costs associated with the hiring and firing of labour, i.e. adjustment costs, place school leavers in a disadvantageous position in the labour market. The cheapest way for firms to reduce the size of their work-forces is via a cessation or reduction in recruitment, and this action affects school leavers in particular. Moreover, there are good reasons to believe that if firms need to engage in firing, school leavers are cheaper to fire than older workers.

1.3.3. Changes in Employer's Hiring Practices

Turning to the second question, i.e. why school leavers might not have benefited greatly from what little recruitment firms undertook after the onset of the recession in 1979, the first reason for supposing that school leavers have not benefited from such recruitment is that the net increase in all ages' total employment in Scotland after 1979 was solely due to an increase in female, part-time employment (see Chapter Five, and MSC (Scotland), 1984). As will be seen in Chapter Five, almost all school leavers were employed full-time. Since

they are not in the market for part-time employment school leavers could not have shared in the increase in all ages' part-time employment.

The second reason for supposing that school leavers may not have benefited greatly from firm's recent recruitment is that school leavers may have been at a disadvantage, compared to older workers, in the competition for full-time jobs after 1979. The reason for supposing this is that it may well be that firms reacted to the decline in their sales and output by raising hiring standards. Such a course of action is consistent with the view that firms take both the price and quality of labour into account when making hiring decisions. That is, if wages are not fully flexible, firms may attempt to optimise over price and quality at the same time when hiring workers and they can be expected to alter their hiring standards in response to changes in their sales, i.e. they will lower their hiring standards in times of economic buoyancy and raise them during recessions. (Reder, 1955).

The reason for expecting anti-cyclical hiring standards is that fluctuations in firm's sales will cause fluctuations in worker's marginal revenue products. In the absence of sufficient wage adjustment, firms will have to respond to these changes in worker's marginal revenue products, by adjusting the size of their work-forces, as discussed above, and by changing their hiring standards in an attempt to raise worker's marginal physical productivity.

One particular account of the relationship between firm's sales and hiring standards is Thurow's (1976) "Job Competition" or "Labor Queue" model. In Thurow's (1976) model, it is assumed that the offered wage is fixed, and, that worker's productivity resides in the job that they are doing, rather than in them as individuals. It is further assumed that employers offer jobs with training opportunities, i.e. "training slots", to applicants, and that applicants then

compete for such jobs on the basis of their expected training costs. Employers are assumed to use applicant's observable characteristics, such as: education, age, sex, personal habits, test scores, previous employment history, etc. as predictors of training costs. Employers then rank applicants according to their expected trainings costs to form what Thurow (1976) calls their "labor queues". These labour queues have the applicants with the lowest expected training costs at their head and those with the highest expected training costs at their rear. Employers decide, depending upon their sales, how many new workers they require in any period and move down their labour queues hiring applicants until they meet their requirements. Since employers will differ in which observable characteristics they believe to be good predictors of training costs and in their beliefs as to their relative importance, and, because jobs will differ in their training requirements, all applicants will have some chance of getting a job.

The question then arises as to whether employers regard school leavers as having higher expected training costs than older applicants. Two studies of the hiring of young people (MSC, 1978; Markall and Finn, 1981) discovered that employers perceived young people as being ill-disciplined, unreliable and immature. Employers argued that these qualities necessitated the incurring of extra fixed costs for the supervision and control of young people, and that these hidden fixed costs discouraged them from hiring young people. In this regard, it is interesting to note that Ashton *et al.* (1982) found that 70% of the employers they interviewed were satisfied with the work of the young people they had recruited in the previous two years. This may suggest that employers are more negatively inclined towards young people ex ante than they are ex post. But, the important point is that at the time of hiring, school leavers may well be perceived by employers as having higher training costs than older

applicants. Moreover, since school leavers have only recently entered the labour market, they have had very little time to accumulate general training, i.e. training that can be put to use in any firm. If employers cannot fully pass on the costs of providing general training to young people (for instance, because of union-imposed minimum wages), then, they will have to expend more money, on average, on providing training for school leavers than for older workers.

On the other hand, one consideration which might incline employers to believe that school leavers might have lower expected training costs than older workers is that employers may perceive school leavers as being more adaptable, flexible and less set in their ways than older workers (Hunt and Small, 1981; Markall and Finn, 1981; Lee and Wrench, 1983 and Livock, 1983).

If, on balance, employers believe school leavers to have higher expected training costs than older workers because of their lack of general training, e.g. "experience", "industrial discipline", then, school leavers will have been at a disadvantage, compared to older workers, since the onset of the decline in total employment in Scotland in 1979. This is partly because, when firms reduced their hiring, they no longer proceeded as far down their labour queues as previously and this will have reduced the employment chances of less attractive, i.e. more costly, applicants such as school leavers, and will have caused a change in the composition of employers' demand for labour in favour of the more attractive, i.e. less costly, applicants such as older applicants. Moreover, another effect of the decline in firm's hiring will have been the creation of a larger excess supply of adult worker's labour. The fact that there would have been more adult workers (ahead of school leavers) in each employer's labour queue may well have meant that employers could satisfy their hiring requirements by hiring only adult workers.

1.3.4. Summary

To summarise the above discussion of the demand deficiency explanation, the decline in school leavers' employment is attributed to the particular sensitivity of their employment to economic downturns. This particular cyclical sensitivity is itself partly attributed to the fact that firms used the suspension of recruitment as the principal means of reducing the size of their work-forces from 1979 onwards, and also partly to the fact that school leavers may have lost out to older workers in the recruitment process, due to their not being in the market for part-time jobs and due to employer's beliefs about their attractiveness, relative to older people, as potential workers.

1.4. Why Did Scottish School Leavers' Employment Decline?: The Relative Pay Explanation

1.4.1. Introduction

The relative pay explanation of the decline in young peoples' employment and rise in their unemployment has taken centre stage in economists' discussion of the problem and has generated a sizeable body of applied work. Furthermore, its results have been readily accepted by the Government. For these reasons, this explanation of the decline in young peoples' employment and rise in their unemployment is of great interest and consequence, and, needs to be given a critical examination.

The basis of the relative pay explanation of the decline in young people's employment was related in the following terms by the Prime Minister, to the House of Commons, in July 1980:

> "The Government believes that more needs to be done to help school leavers into jobs. Because the wages of young people are often too high in relation to those of experienced adults, employers cannot afford to take them on - even though it is clear that many employers want to help. That situation has come about because of unrealistic pay bargaining over the years.

> It contrasts vividly with the situation in Germany where the wages of young people are much lower relative to those of adults and where, consequently, there is less youth unemployment." (Hansard, 27th July 1981, cols 835-836) (Quoted in Pond, 1982).

More recently, Mr Peter Bottomley, the then Under Secretary of State for Employment, stated that:

> "The conclusion that the employment prospects of young people are adversely affected by the high cost of their labour was reached after evaluating the results of a number of studies..." (Quoted in Employment Gazette, Vol 43, No.2 (1985) p.79).

1.4.2. The Econometric Studies

The studies referred to above consist of time-series studies of the relationship between young peoples' relative pay and other variables and their employment or unemployment.[8] Table 1.2 contains brief details of the time-series studies that examined the relationship between young peoples' relative pay and their employment, and, Table 1.3 contains brief details of the time-series studies of the relationship between young peoples' relative pay and their unemployment.

Pond (1982), Raffe (1985c) and Main (1987) have all claimed that the relative pay explanation is, not relevant when considering the decline in young peoples' employment that occurred in the early 1980's; the reason being that young peoples' pay relative to adults declined during this period. It can be seen from Figures 1.6 and 1.7, taken from Wells (1984), that, relative to males aged 21 and over, the pay of young males, i.e. males aged under 21, increased sharply between 1973 and 1975; and fell quite steeply between 1982 and 1984. Young males' pay relative to females aged 18 and over, rose steeply between 1972 and 1974, and fell quite steeply thereafter. Young females', i.e. females aged under 21, pay relative to males, aged 21 and over, rose between 1973 and 1977

Table 1.2

Brief Details of the Studies

Study	Hutchinson et al.	Merrilees & Wilson	Layard	Wells	Pike
Estimating Period	1952-72 Annual	1969-78 Annual	1949-1969 Twice Yearly	1969-81 Annual	1948-82 Annual
Disequilibrium/ Equilibrium Assumption	Disequilibrium	Disequilibrium	Equilibrium	Disequilibrium	Equilibrium
Single Equation/ Simultaneous Equation Model	Single	Simultaneous	Single	Simultaneous	Single
Dependent Variable	Absolute Employment of Young Males	Relative Employment of Young People	Cost Shares of Different Groups	Relative and Absolute Employment of Young People	Same as Layard
Estimating Equation Type	Demand	Reduced Form	Demand	Demand	Demand
Equation(s) Discussed Here	(12)	(10)	All	Table 19	All
Age Definitions	Young Males = under 20	Young Males = under 21 Young Females = under 18	Same as M & W	Same as M & W	Same as M & W
Note:	Dynamic Structure of Equation determined by Econometric Testing	First Differences of Logs. No Adjustment Process. Lagged Relative Wages. (one period)	No Adjustment Process. No lags.	First Differences of Logs. No Adjustment Process. No Lags.	Adjusted for Auto-Correlation. No Adjustment Process. No lags.

Table 1.3

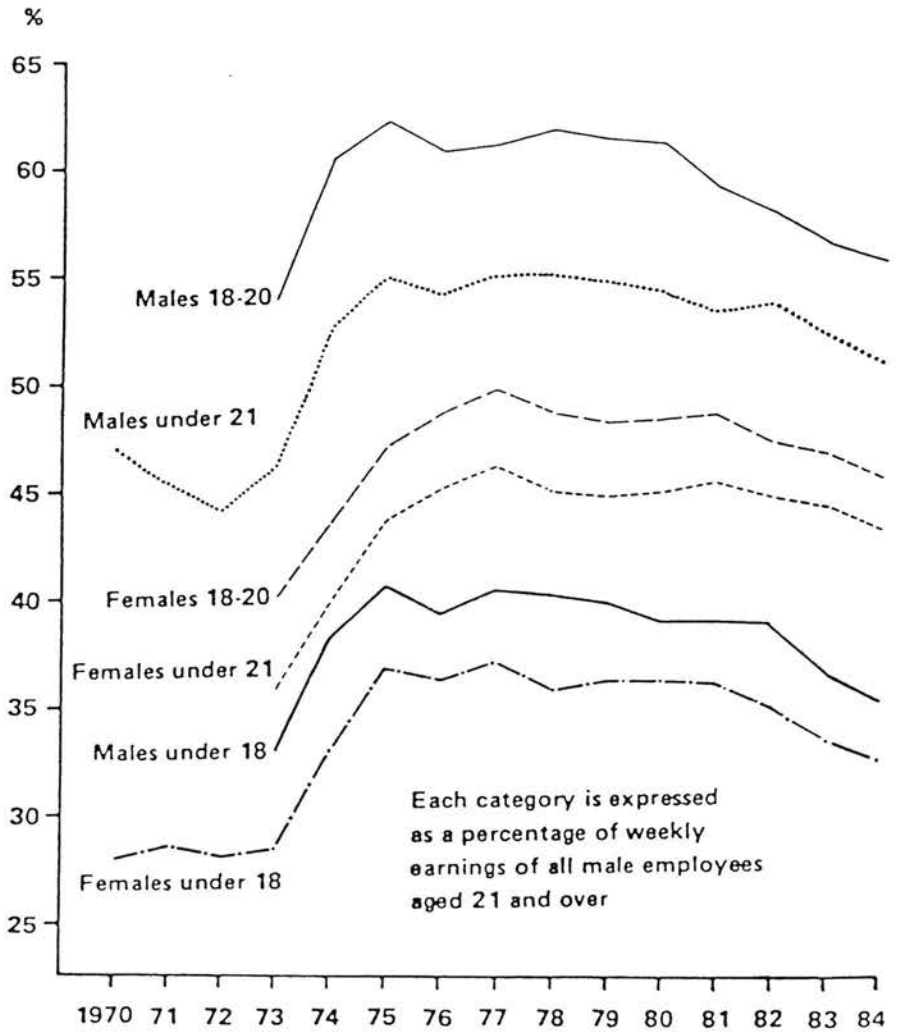
Brief Details of the Studies

Study	Makeham (1980)	OECD (1982)	Wells (1983)	Layard[1] (1982)	Lynch & Richardson (1982)	Rice (1984)
Estimating Period	1959-76	1959-79	1969-81 Males 1971-81 Females	1959-76	1950-78	1953-79
Dependent Variable	Unemployment Rate	Unemployment Rate	Unemployment Rate	Relative[2] Unemployment Rates	Relative Unemployment Totals	Unemployment Total
Regime Switch Allowance	No	No	Yes	No	No	Yes
Relative Labour Cost Term	Yes	No	Yes	Yes	Yes	Yes
Age Definitions	School Leavers Under 20 20-24	Under 20 20-24	Under 18	Under 20	Under 20	Under 20
Equation/Table referred to	Tables A1-A22	Table 15	Table 18	Table 15.12	Tables 1, 2	Tables 1-6

1. Layard (1982) only estimates equations for males.

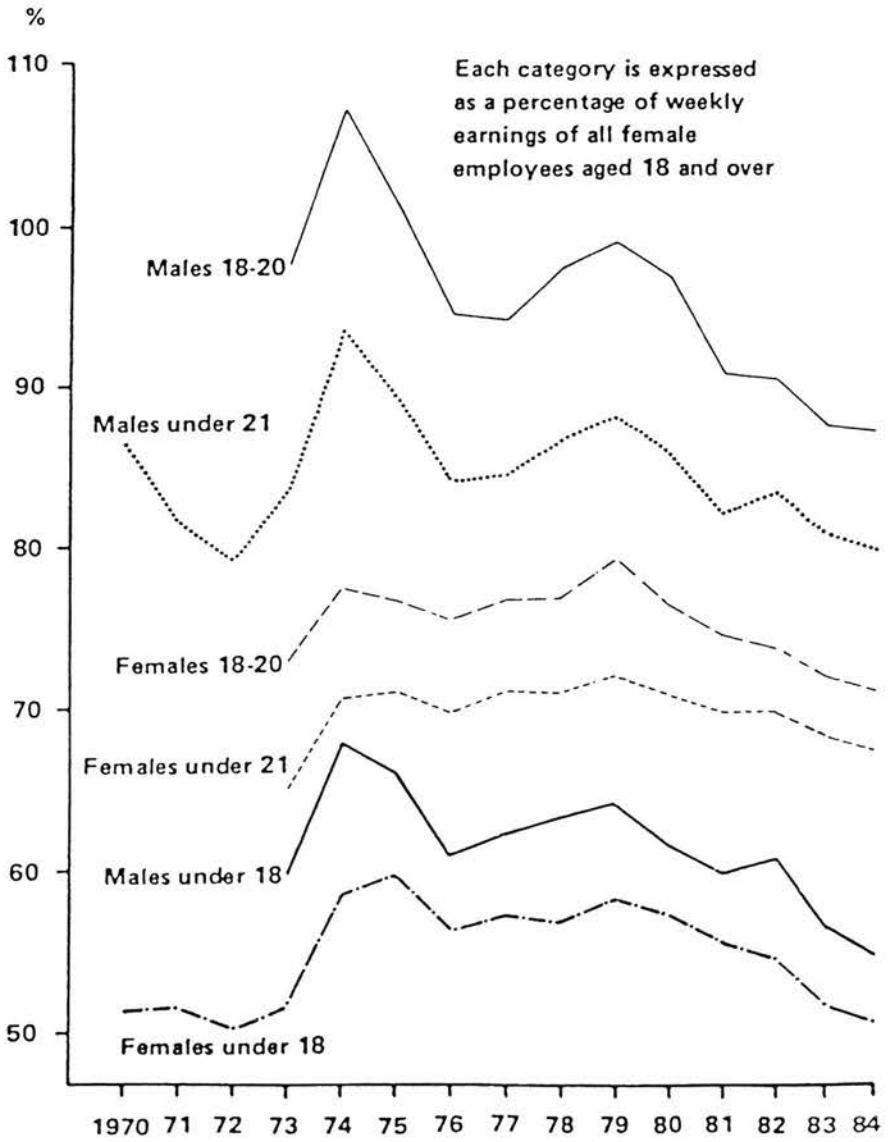
2. Relative unemployment is defined as the unemployment rate of young people divided by the unemployment rate of adults (Layard, 1982) or relative total unemployment (Lynch and Richardson, 1982) for both groups.

Figure 1.6 Average gross weekly earnings[1] of full-time employees under 21[2] as a percentage of the corresponding figure for <u>males</u> aged 21 and over: (all workers)



Source: Wells (1984)

Figure 1.7 Average gross weekly earnings[1] of all full-time employees under 21[2] as a percentage of the corresponding figure for all females aged 18 and over at April each year



Source: Wells (1984)

and fell thereafter; falling quite steeply after 1982. Young females' pay relative to females aged 18 and over showed a slight rise between 1973 and 1979, and a steep decline thereafter. So, New Earnings Survey data suggest that young peoples' relative pay has been falling since at least 1977, and sometimes even before 1977. That is, the large increase in young peoples' unemployment and decline in their employment which have taken place since the mid 1970's appear to have done so against the background of declining relative pay for young people.

1.4.3. The Econometric Studies of The Relationship Between Young Peoples' Relative Pay and Employment

Turning to the discussion the time-series studies of the relationship between young people's relative pay and employment, these studies (Merrilees and Wilson, 1979; Layard, 1982; Wells, 1983; Hutchinson *et al.*, 1984 and Pike, 1984) all assumed that, on the demand side, employing firms can be characterised as cost-minimisers (see Briscoe and Peel, 1975; for a review of alternative assumptions). The employing firms have also been assumed to be price-takers. Such price-taking, cost-minimising firms aim to produce their output at least cost and treat their sales as exogenous (Briscoe and Peel, 1975). The main advantage of the cost minimisation assumption, as far as the econometric studies are concerned, is that it allows one to ignore the output effect of a change in a factor price and consider the substitution effect in isolation.

All the studies were greatly concerned with the degree of substitutability/complementarity between young and other workers and attempted to explain the estimated coefficient on the relative pay variable in terms of the substitutability/complementarity between young workers and other workers. (see Layard and Walters, 1978, Ch.9, for a discussion of elasticity of

substitution measures). If only two groups of workers are distinguished then they must necessarily be substitutes, if more than two groups of workers are distinguished then there arises the possibility that some groups of workers may be complements for other groups. Turning to the case of young people in particular, the elasticity of substitution between young people and adults will be affected by: such things as the skills required within given occupations, the "maturity" required of workers, and, the existence of legal minimum age requirements. Young people tend to be unskilled, or in the process of training, and hence the elasticity of substitution between them and adult skilled workers can be expected to be low. Where the job concerned requires mature attitudes and behaviour young people may be effectively excluded, and the elasticity of substitution between them and adults near to zero. The elasticity of substitution will be zero in jobs in which legal minimum age debar young people.

The other variable included in a cost minimising demand for labour function is the scalar level of output; correspondingly, some kind of output variable was included in all the studies' estimated demand, or reduced form, equations. The output variables used in the studies were: the registered rate of unemployment (Merrilees and Wilson, 1979; Wells, 1983), and, current or lagged output (Layard, 1982; Hutchinson *et al*, 1984; Pike, 1984).

The time-series studies of the relationship between young peoples' relative pay and employment differed according to whether they initially assumed that the youth labour market was characterised by equilibrium or disequilibrium. Some studies explicitly (Hutchinson *et al*, 1984) and others implicitly (Layard, 1982; Pike, 1984) assumed that the youth labour market was characterised by excess supply and hence only estimated demand equations. Merrilees and Wilson (1979) initially asserted that the youth labour market was characterised

by disequilibrium and then tested their assertion by estimating separate demand and supply equations by OLS, which is appropriate if the youth labour market was characterised by disequilibrium, and then compared the results with equations estimated using the Two Stage Least Squares technique, which assumes equilibrium.[9]

1.4.4. The Econometric Studies of The Relationship Between Young Peoples' Relative Pay and Unemployment

Turning now to the consideration of the econometric studies of the time-series relationship between young peoples' relative pay and unemployment (Makeham, 1980; Layard, 1982; Lynch and Richardson, 1982; OECD, 1982; Wells, 1983; and Rice, 1986), with one notable exception (Rice, 1986) all of these studies were rather *ad hoc* in nature and suffered from a number of problems relating to the treatment of their dependent variables.

With regard to the study's dependent variables, it should be appreciated from the outset that changes in any unemployment total or rate, (as used by Makeham (1980), OECD (1982), Wells (1983) and Rice (1986)), can be brought about by changes in a number of separate phenomena. These phenomena include: the number of individuals in the relevant labour market group (which affects the unemployment total only), the outcome of individual's participation decisions, the outcome of individual's work/leisure decisions, individual's employment stability, the intensity of individual's job search and last, but not least, the number of jobs available. A change in any unemployment total or rate can be caused by a change in any of these phenomena. Two of the studies, Layard (1982) and Lynch and Richardson (1982), used the ratio of youth to adult unemployment as their dependent variable. The problem with using this variable as the dependent variable is that it will change if changes in any of the phenomena listed above causes the adult unemployment total to change,

i.e. the ratio of youth to adult unemployment can change for reasons which have nothing to do with the labour market experience of young people. For instance, the post-war secular increase in married women's participation in the labour market can be expected to have increased the denominator over time and to have led, *ceteris paribus*, to a decline in young peoples' relative unemployment. Furthermore, the data used in the studies relates to registered unemployment. The levels and rates of registered unemployment may change for reasons wholly unrelated to conditions in the labour market, such as changes in the official definition of unemployment, the rules relating to unemployment compensation entitlement, the method used for collecting the figures, etc. For all these reasons, the use of the registered totals and rates of unemployment is a rather problematic practice.

All of the studies can be seen as utilising a reduced form relationship derived from a more complex structural model consisting of demand and supply equations. Following in the footsteps of Maki and Spindler (1975), Rice (1986) has drawn attention to the distinction between those who are in the labour market and out of work and those who are in the labour market, out of work and also willing to work at the prevailing level of real market wages. That is, a distinction is drawn between the apparent supply of labour, which relates to the number of people in the labour market, i.e. to the outcome of individual's participation decisions, and, the effective supply, which relates to those individuals in the labour market who are also willing to work at prevailing real market wages, i.e. to the outcome of individual's participation and work/voluntary unemployment decisions. Apparent supply exceeds effective supply by the number of people voluntarily unemployed. In equilibrium, therefore, since demand equals effective supply, all unemployment must be voluntary. Voluntary unemployment is here defined to be unemployment that is

chosen by individuals because they do not consider the prevailing level of real wages to be high enough to compensate them for the loss of leisure time, or loss of home production time, caused by working. This type of voluntary unemployment is not the same thing as frictional unemployment; which is due to individuals being between jobs.

This distinction between apparent and effective supply is important because any study which estimates a relationship between young peoples' absolute or relative unemployment and a relative pay variable will have an ambiguous sign on the relative pay variable unless it takes into account the possibility of disequilibrium in the youth labour market and also adequately models young peoples' labour supply behaviour. The reason is that, in a situation of excess demand, until the real wage reaches its equilibrium level, increases in young peoples' relative pay, which result from increases in their real wage, are associated with decreases in voluntary unemployment. That is, in a situation of excess demand there is no involuntary unemployment, and increases in the real wage serve to increase the opportunity cost of voluntary unemployment and reduce the number of voluntarily unemployed young people, It is only after the real wage exceeds its equilibrium level that changes in the real wage are associated with *increases* in unemployment. Only then is it true that young peoples' employment is demand-determined. Consequently, any equation which fails to take into account the possibility of disequilibrium, regime switching and the difference between apparent and effective labour supply may have an ambiguous sign on the relative pay variable. That said, only one study Rice (1986), actually took the possibility of disequilibrium etc. into account. Consequently, the coefficients on the relative labour costs variable, estimated by Makeham (1980), Layard (1982), Lynch and Richardson (1982) and Wells (1983), must be regarded with caution.

All the studies included a cyclical variable in their estimating equations, in order to take account of the effects of conditions in the goods and labour markets on young peoples' unemployment. The variables used in the studies were: GDP (Rice, 1986), total unemployment (Makeham, 1980; Lynch and Richardson, 1982; Wells, 1983), adult unemployment (Makeham, 1980; Layard, 1982), and total vacancies (Lynch and Richardson, 1982). Rice (1986) also included the unemployment/vacancy ratio and the change in the ratio, which might be thought of a cyclical variable, to account for actual and unanticipated changes in the waiting time for a job offer.

As noted above, an important point of distinction between the studies lay in the way in which they modelled young peoples' labour supply. The majority simply assumed that actual supply was some function of potential supply, and included a demographic variable, which related to young peoples' absolute or relative (relative to the total) population numbers (Makeham, 1980; Layard, 1982; Lynch and Richardson, 1982; OECD, 1982). Wells (1983) did not consider supply at all. Only Rice (1986) explicitly modelled the determinants of young people's labour supply.

A final point to note is that since the mid 1970's, the Government has operated a number of schemes designed for unemployed young people, one effect of which was to reduce their measured unemployment rate. However, only two of the studies included a (dummy) variable designed to account for the influence of such schemes (OECD, 1982; Rice, 1986). This omission by Layard (1982), Lynch and Richardson (1982), Makeham (1980) and Wells (1983) of any consideration of schemes is important because it means that the dependent variable does not relate to the same entity at the beginning and at the end of their estimation periods.

1.4.5. The Wage Data Used in the Econometric Studies

All the studies reviewed in this section used the same data source until 1979, namely, the data from The Enquiry into the Earnings and Hours of Manual Workers. The data source used by Wells (1983) for 1980 and 1981 were extrapolated values from a regression, relating data from The Enquiry into the Earnings and Hours of Manual Workers to data from The New Earnings Survey over the period 1971-1979 (Wells, 1983, Table D4).

The Enquiry data related to manual workers in the manufacturing industries; mining and quarrying; construction; gas, electricity and water; transport and communication; public administration and defence and certain miscellaneous services. The data came in two forms, i.e. for all these industries together and for the manufacturing industries alone. The Enquiry was conducted twice a year between 1948 and 1979. Only Merrilees and Wilson (1979) and Layard (1982) used the biannual data, all the others used the October data. The data distinguishes between four sex/age groups, namely, males aged under 21, females aged under 18, males aged over 21 and females aged over 18. The figures for females were also divided according to whether the workers worked full or part-time.

This data set has a number of deficiencies. Firstly, the age at which the distinction between young people and adults was made was rather arbitrary and differed between the genders for no good reason. Secondly, the arbitrary dividing age meant that the relative pay of young people might increase for purely compositional reasons, e.g. the raising of the school leaving age in the early 1970's removed a large number of relatively lowly paid 15 year olds from employment, thus raising "young peoples'" relative pay (see Wells, 1983). Finally, the fact that service sector, non-manual occupations were excluded meant that the data excluded a large proportion of employed young females;

and a smaller proportion of young males.

1.4.6. The Results of the Time Series Studies of the Relationship Between Young Peoples' Relative Pay and Employment

The first thing to consider is the existence or non-existence of equilibrium in the youth labour market. Those studies which considered the possibility of disequilibrium in the youth labour market discovered from their estimation results that the period from 1952 to 1969 for males, and 1952 to 1971 (Merrilees and Wilson, 1979), or the early 1970s (Wells, 1983) for females, was characterised by excess demand and the period thereafter by excess supply (Merrilees and Wilson, 1979; Wells, 1983). This finding is important because it implies that the equations estimated by some of the researchers will not be identified, because they estimate demand equations during a period of excess demand (Layard, 1982; Hutchinson *et al*, 1984). Pike (1984), whose period of estimation stretched from the earlier period of excess demand through to the later period of excess supply, can only have identified a demand equation during the latter part of her estimating period.

All of the studies found that the employment, both absolute and relative, of young males, was significantly and negatively related to their relative pay. However, the employment of young females was not always found to be significantly and negatively related to their relative pay (Layard, 1982; Wells, 1983). The most detailed analysis by age (Wells, 1983) found that the *only* significant, negative relationship between young peoples' relative pay and employment was for males aged under 18.

It can be seen from Tables 1.4a, 1.4b, and 1.4c that the pattern of substitutability/complementarity between different groups of workers found in the studies was somewhat mixed. Young males were found to be substitutes

Table 1.4a

Wage Coefficients

Study	Hutchinson et al. (1984)	Merrilees and Wilson (1979)		Wells (1983)
Sex	Males	Males	Females	Males
Estimating Period	1952-72	1969-78	1971-78	1969-81
Dependent Variable	Employment of[1] Under 20 Year Olds	Ratio of Under 20 Year Olds' Employment to Adult Employment of Same Sex		Ratio of Under 18 Year Olds' Employment to Total Employment
Wage Variables:[2,3]				
(WYM/WAM)	2.78*	-1.15*		-2.90*
(WYM/WAF)			-1.13*	
(WYF/WAF)				-1.45*
(WYM/WAFFT)	-1.66*			
(WYM/WAFPT)	-2.56*			

Notes: (1) All variables are in natural logarithms. Merrilees and Wilson's (1979) and Wells' (1983) equations were estimated in first differences.

(2) Hutchinson et al.'s wage variable is lagged two periods.

(3) Merrilees and Wilson's (1979) wage variable is geometrically lagged, the lag being truncated in the case of males.

(4) *Significant at 5% level.

Sources: Hutchinson et al. (1984) Eqn 1.8, Merrilees and Wilson (1979) Eqns (9) and (10), Wells (1983) Table 18, Eqn D2a.

Key:
W = Wage
AM = Adult males
AF = Adult females
AFFT = Adult female full time
AFPT = Adult female part time
YM = Young males
YF = Young females

Table 1.4b

Layard (1982)[1,2] Estimated Elasticities of Substitution

	Youths	Girls	Women	Men
Youths	-33.6	22.1	3.1	0.6
Girls		-23.5	-5.3	0.4
Women			-9.9	2.0
Men				-0.4

1. The negative figures on the main diagonal are own wage elasticities. The figures off the diagonal indicate complementarity when negative and substitutability when positive.

2. Layard (1982) does not indicate the significance or otherwise of these elasticities and does not indicate the degrees of freedom.

Source: Layard (1982) Table 15.13

Table 1.4c

Pike (1984)[1,2] Estimated Elasticities of Substitution

	Full-time Females	Girls	Part-time Females	Youths	Men
Full-time Females	-4.44*	- 3.68	1.48	- 4.94*	1.08*
Girls		-185.90*	62.60*	0.40	0.82
Part-time Females			-114.36*	8.56*	1.33*
Youths				-13.39*	1.30*
Men					-0.66*

1. See Note (1), Table 1.4b

2. The estimating equation was estimated making allowance for first order auto correlation.

Source: Pike (1984) Table 3b.

Notes to Tables 1.4a, 1.4b and 1.4c

(a) Girls = Females under 18, Youths = Males under 21, Men = Males over 21, Women = Females over 18

(b) W = Earnings
YM = Youths, AM = Men, YF = Girls, AF = Women, AFFT = Full-time Women, AFPT = Part-time Women

for young women by Layard (1982) and Pike (1984). To be complements for adult men by Hutchinson *et al*, (1984), and substitutes for adult men by Merrilees and Wilson (1979), Layard (1982), Wells (1983) and Pike (1984). Young males were found to be substitutes for all adult women by Layard (1982) and Wells (1983); substitutes for full-time adult women by Hutchinson *et al.* (1984), Wells (1983), and Pike (1984); and substitutes for part-time women by Wells (1983), Hutchinson *et al*, (1984) and Pike (1984). Young women, on the other hand, were found to be substitutes for men by Pike (1984), complements for all adult women by Layard (1982) Pike (1984) found young women to be complements for full-time adult women and substitutes for part-time adult women.

From the above it seems that the role of relative wages in the decline in young peoples' employment in the late 1970s has yet to be proven. For a start, the studies by Layard (1982), Hutchinson *et al.* (1984) and Pike (1984) suffer from identification problems which make it impossible to unambiguously identify the coefficient on the relative wage variable as a measure of the substitutability or complementarity of young people for adults in employment. Furthermore, in the case of these studies which actually take the possibility of disequilibrium into account and identify a demand equation during the excess supply regime that existed in the youth labour market in the 1970's (Merrilees and Wilson, 1979; Wells, 1983), there is the problem that they suffer from an acute shortage of degrees of freedom and that they have to account for the fact that whilst the largest increase in young peoples' relative pay took place before 1976, the largest decrease in their relative employment took place after 1976 (Wells, 1983). Furthermore Wells' (1983) study suffers from data problems with respect to the dependent variable since his data relating to employment by age had to be estimated by four different methods between 1972 and 1981

(see Wells, 1983, Table D11, Notes 1 to 4). Wells (1983) is forced to admit in a note to his Table D11, which shows male employment by age, that: "Estimates for individual ages are very uncertain and should only be taken as indicative". Wells (1983) also suffered from data problems with the relative pay variable during the last two years of his estimating period, since as noted above the data had to be estimated.

1.4.7. The Results of the Time Series Studies of the Relationship Between Young Peoples' Relative Pay and Unemployment

Turning to the consideration of the results of the time-series studies of the relationship between young peoples' relative pay and unemployment, the first issue to be considered is that of the existence or non-existence of equilibrium in the youth labour market. Only Rice (1986) tested for the possibility and she found evidence of disequilibrium. She discovered that the market for young males' labour was characterised by excess demand until 1971/72 and excess supply thereafter; the market for young females' labour, on the other hand, was found to be characterised by excess demand until 1970/71 (with the exceptions of 1963/64 and 1965/66, which were characterised by excess supply) and excess supply thereafter. Moreover, she found evidence which indicated that the relationship between young females' relative pay and their unemployment rate underwent a structural shift in the late 1970s.

It can be seen from Table 1.5 that the relative pay variable performed erratically across the studies. Makeham (1980) found the variable to be insignificant. Wells (1983) only found it to be significantly and positively, related to the unemployment rate of under 18 year old males. Layard (1982) found it to be significantly and positively related to teenage males' relative unemployment if total vacancies were used as the cyclical variable, but not if adult unemployment was used as the cyclical variable. Lynch and Richardson

Table 1.5

A Brief Summary of the Econometric Results

Study	Makeham (1980)				OECD (1982)		Wells (1983)		Layard (1982)		Lynch and Richardson (1982)				Rice (1984)	
Age Group	Under 20		School Leavers		Under 20		Under 18				Under 20				Under 20	
Dependent Variable	Unemployment Rate				Unemployment Rate		Unemployment Rate		Relative Unemp. Rates		Relative Unemployment Totals				Unemployment Total	
Estimating Period	1959-76				1959-79		1969-1981	1971-1981	1959-76		1950-78				1953-79	
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Cyclical Variable																
Male Unemployment Rate	1.65*		4.86*		1.70*		1.00*	0.55			0.23*					
Female Unemployment Rate		2.51*		3.35*		1.68*						0.18*				
Male Adult Unemployment Rate									0.38* to 0.43*							
Total Vacancies										-0.38* to -0.54*			-0.16*[1]	-0.23*		
G.D.P.															- 3.55*	- 0.14
Relative Labour Costs Variable:																
Own Sex[2]	0.15	-0.09	0.46	0.74			10.10*	-2.34	0.60 to 1.52	4.07* to 5.01*	0.52	2.38*	1.28*	2.52*	-111.59*	
Opposite Sex[3]							2.83	5.21								-124.92*

Notes: 1. * Denotes significance at at least the 5% level.
2. Own sex refers to the relative labour costs of young people of one sex relative to adults of the same sex.
3. Opposite sex refers to the relative labour costs of young people of one sex relative to adults of the opposite sex.

Sources: 1. Makeham (1980):
(a) Under 20 Year Olds: Table A8
(b) School Leavers: Table A16 for Males, Table A22 for Females
2. OECD (1982): Table 15
3. Wells (1983): Table 18
4. Layard (1982): Table 15:12
5. Lynch and Richardson (1982): Table 1 (Males), Table 2 (Females)
6. Rice (1984): Table 1, Disequilibrium Estimates

(1982) found the relative pay variable to be significantly and positively related to both young males' and young females' relative unemployment; though it was only significant in the male equation if total vacancies were used as the cyclical variable. Finally, Rice (1986) found the variable to be significantly and positively related to both gender's youth unemployment total during the period of excess supply in the youth labour market during the 1970s.

In the case of those studies which made no allowance for regime switching and chronic disequilibrium and yet obtained significant positive coefficients on the relative pay variable, (Layard, 1982; Lynch and Richardson, 1982) it is not at all clear what this result actually signifies. In the case of those studies which allow for the possibility of disequilibrium and also find a significant coefficient on the relative pay variable, i.e. Wells (1983) and, Rice (1986), they suffered from an acute shortage of degrees of freedom.

An examination of the relative pay data contained in Wells (1983) suggests that the only period during which there was a close positive graphical association between changes in young peoples' relative pay and changes in their absolute and relative unemployment totals and rates was in the period from 1973 to 1976. Since 1977 young peoples' relative pay has fallen whilst their absolute unemployment, unemployment total and unemployment rate have all dramatically increased (even after some of the increase in the number of jobless young people had been accounted for by government schemes for the young unemployed). Furthermore, until 1981, young peoples' unemployment rate relative to all ages' unemployment tended to fall. This suggests that if young peoples' relative pay played any role in determining their absolute and relative unemployment totals and rates its effect was limited to a short period in the early to mid 1970s.

The cyclical variables differed in their significance between studies. The OECD (1982) study found the youth unemployment rate to be significantly and positively related to all ages' unemployment rate. Makeham (1980) found the youth unemployment rate to be significantly and positively related to the adult unemployment rate, with an elasticity significantly greater than one. Lynch and Richardson (1982) found the ratio of youth to total unemployment to be positively related to the total unemployment rate, with an elasticity significantly greater than zero, and to total vacancies, with a negative elasticity, significantly less than zero. Layard (1982) found the male youth unemployment rate, relative to the adult male unemployment rate, to be positively related to the total unemployment rate, with an elasticity significantly greater than zero, and negatively related to total vacancies with an elasticity significantly less than zero. Wells (1983) found the male under-18 unemployment rate to be positively related to the total unemployment rate with an elasticity equal to exactly one. Wells (1983) found that the equivalent female unemployment rate was not significantly related to the total unemployment rate. Finally, Rice (1986) found the male youth unemployment rate, but not the female rate, to be negatively and significantly related to GDP, with an elasticity significantly greater than one. Those studies which distinguished between young people of different ages (Makeham, 1980; OECD, 1982; Wells, 1983) found that, for both genders, the elasticity of the youth unemployment rate with respect to changes in the all ages unemployment rate fell in value with age. Makeham (1980) found that the largest elasticity in the equations relating to school leavers.

Taken together these results suggest three conclusions. Firstly, the youth unemployment totals and rates changed more quickly and to a larger extent than the equivalent adult and all ages' totals and rates in response to changes in conditions in the goods and labour markets. Secondly, and a consequence

of the first conclusion, young people tended to represent a larger fraction of the total unemployed during recessions than during economic upturns. Finally, both these conclusions appear to apply more strongly to junior young people than to more senior young people.

The potential population variable used in some of the studies (Makeham, 1982; Layard, 1982; OECD, 1982; Lynch and Richardson, 1982) tended to perform erratically. It was found to be significant by Layard (1982) and OECD (1982) and insignificant by Makeham (1980) and significant for females only by Lynch and Richardson (1982). This erratic performance may reflect the failure to account for switches in regime, since during periods of supply constraint in the youth labour market, if young peoples' participation rates did not change, most of the impact of changes in potential population would have been reflected in employment changes. During periods of demand constraint in the youth labour market, on the other hand, all of the impact of changes in potential population will have been reflected in young peoples' unemployment.

Rice (1986) found that changes in unemployment compensation, and hence the opportunity cost of voluntary unemployment, were important in determining the level of both male and female young peoples' unemployment during periods of supply constraint, i.e. excess demand, in the youth labour market. During periods of supply constraint, changes in unemployment compensation affect young peoples' total employment via their effect on the number of young people in voluntary unemployment. On the other hand, during periods of demand constraint, i.e. excess supply, on the other hand, increases in unemployment compensation affect the level of youth unemployment via their effects on young peoples' labour force participation. Rice (1986) found that the effects of changes in unemployment compensation on young peoples' total unemployment during the period of demand constraint, i.e excess supply,

differed between the genders. The effects were negligible in the case of males but important in the case of females. Rice (1986) attributed this difference to the fact that females expect to leave the labour market when they get married and, hence, expect to spend a shorter period in the labour market than males. Consequently, they are more sensitive to the short-term impact of changes in the opportunity cost of education brought about by changes in unemployment compensation.

Rice (1986) attempted to decompose the rise in both male and female youth unemployment in the mid to late 1970s (1973/74 to 1977/78) according to its causes. She found that, for males, the most important factors were two demand side factors: firstly, the decline in rate of growth of output relative to the rate of growth of labour productivity, which was found to account for just over one half of the rise in males' unemployment total, and, secondly, changes in relative labour costs which were found to account for a further third of the rise in males' total unemployment. For females, the most important factors were on the supply side, the most important being the decline in the opportunity cost of voluntary unemployment, i.e. the rise in unemployment compensation, which accounted for nearly 40% of the rise in their unemployment total. The most important demand side factor for females was the increase in relative pay, which was found to account for a further 22% of the rise in their unemployment total.

1.4.8. Conclusions

Given the differences between the methodology and results of the studies reviewed in this section of the Chapter it is difficult to come to many overall conclusions. However, two methodological conclusions can be stated. The first is that it is important, when studying the employment or unemployment of young people, to allow for the possibility of disequilibrium, otherwise it is

difficult to interpret one's results. Secondly, it is necessary to adequately model young peoples' labour supply and, therefore, to allow for the possibility of voluntary unemployment. That is, it is important to distinguish between apparent and effective supply.

Three overall, empirical conclusions can be stated. Firstly, it appears that the market for young peoples' labour has been characterised by chronic disequilibrium over a long period. Secondly, overall, it appears that young peoples' unemployment is more cyclically sensitive than total or adult unemployment, and moves more quickly from peak to trough and vice versa. Finally, although the case is far from proven, the results of some of the studies suggest that increases in young peoples' relative pay were associated with increases in their relative and absolute unemployment levels and rates in the mid 1970's. Given the above discussion of the problems pertaining to the interpretation of these results this must be considered the weakest and most problematic conclusion.

1.5. Why Did Scottish School Leavers' Employment Decline: The Structural Explanation

According to the structural explanation, changes in the composition of the final demand for goods and services and changes in the organisation of the work process have combined to alter the industrial and occupational distribution of all ages' employment in such a way as to destroy many of the jobs previously filled by young people (see Raffe, 1984b; for a critical review and references). These changes are contended to be secular rather than cyclical; although it is argued that they may have accelerated during the recession that started in 1979. These secular changes include: the shift in all ages' employment away from manufacturing towards the service industries, upskilling in the work place, mechanisation, and, the rise of industries based

upon new technology, e.g. information technology. Since these structural changes are held to be secular, and hence irreversible, it is argued that high levels of youth unemployment are here to stay and that young people would have suffered some increase in their unemployment even if the economy had not entered a recession. The proponents of the structural explanation are usually sociologists, e.g. Ashton and Maguire, 1983; Roberts, 1986; Roberts *et al*, 1986; but see also NYEC, 1974.

In a blistering critique of the structural explanation, Raffe (1984b) points out that proponents of the structural explanation often contradict one another and provide little empirical evidence to support their assertions. He also points out that many of the so-called structural changes are, in fact, caused by the uneven impact of demand deficiency across industries and occupations, e.g. an increase in unskilled workers' unemployment may indicate that firms are more willing to retain workers in whose training they have invested, rather than a process of occupational upskilling, etc. Finally, Raffe (1984b) argues that the sudden rise in youth unemployment in the late 1970's and early 1980's is inconsistent with an explanation that stresses gradual secular change.

So, it appears that gradual, secular structural changes in the economy are unlikely to have accounted for the rapid rise in youth unemployment in the late 1970's, and early 1980's.

1.6. So Why Did Scottish School Leavers' Employment Decline?

The empirical evidence relating to the relationship between young peoples' relative pay and employment is rather weak, and it may well be that changes in young peoples' relative pay and employment are only weakly connected. It also seems unlikely that gradual secular trends in the structure of the economy can account for the sudden decline in school leavers' employment in the late

1970's and early 1980's. However, one thing is sure, the decline in Scottish school leavers' employment coincided with the onset of a severe recession. It seems likely that the demand deficiency explanation, with its emphasis on the combination of the decline in employer's recruitment, the lengthening of employer's labour queues and the displacement of school leavers by older workers at the front end of employer's labour queues, can adequately account for the decline in Scottish school leavers' employment.

1.7. The Scottish Education Data Archive[10]

1.7.1. History of The Scottish Education Data Archive

In 1966, The Scottish Education Department (SED) began a series of surveys of educationally qualified school leavers in Scotland. The "Qualified Leavers Survey" was designed to provide government departments with in-house intelligence primarily concerning the flow of qualified leavers from school into higher education.

In 1971, The Centre for Educational Sociology (CES), University of Edinburgh, conducted a survey of those school leavers with at least one Higher,[11] using as their sampling frame those school pupils included in the SED's 1970 Qualified Leavers Survey. This was followed by a similar survey in 1973. Both these surveys were academic research surveys, the primary purpose of which was to throw light on qualified school leaver's choices as to whether or not to continue into full-time higher education or teacher training at the end of their secondary schooling.

In the mid 1970's, the SED extended its target population to include all those school leavers who had sat Scottish Certificate of Education examinations, i.e. for Highers and O grades, and/or the General Certificate of Education examinations, i.e. O Levels or A Levels.[12] As before, the CES used the

SED's survey as its starting point in drawing up the sampling frame for the first comprehensive survey of Scottish school leavers, which it planned to conduct in 1977. Moreover, the CES, with the cooperation of the Scottish education authorities and with the aid of a grant from the Social Sciences Research Council, (now The Economic and Social Research Council) decided to extend its target population to *all* school leavers, i.e. including those who had not sat for public examinations. Consequently, since 1977, the CES has conducted biennial surveys of Scottish school leavers, in 1979, 1981, 1983 and 1985. A small pilot survey, principally restricted to Fife, was conducted for the Manpower Services Commission in 1984. Since 1985, the surveys have contained a cohort as well as a leaver component. The cohort component consists of a sample of all those young people who were in the fourth form at school in 1985. A second sweep of those in the 1985 cohort was conducted in 1986 and a third sweep will shortly be undertaken.

1.7.2. Details Concerning The Nature and Administration of The 1977, 1979, 1981 and 1983 Scottish School Leavers Surveys

The target population for the 1977 Scottish School Leavers Survey (SSLS) consisted of all those young people who left Scottish schools in the 1975/76 session. The sampling frame was constructed from two sources. Firstly, from those young people who had been included in the SED's 1976 survey of 20% of all those school leavers who had sat for at least one O Grade. In the course of the SED's survey, the respondents were asked whether they agreed to be included in the 1977 SSLS survey. Those who agreed were included in the SSLS sampling frame. Secondly, schools were asked, via their Local Education Authority, to supply the names and addresses of all leavers in the 1975/76 session. The sampling fraction for the 1977 SSLS was 40% of all those young people leaving school in the 1975/76 session. It was anticipated that the

response rate from non-certificated school leavers might turn out to be considerably lower than that for other school leavers, and therefore such leavers were only included in five regions of Scotland: Fife, Lothian, Shetland, Strathclyde and Tayside.

In February 1977, the CES sent out postal questionnaires to those school leavers in its sampling frame. If school leavers did not respond to the initial questionnaire they were sent a reminder postcard, if they still did not respond they were sent another postcard and if that failed, a second questionnaire. This follow-up procedure did not change between 1977 and 1983. When the completed postal questionnaires were returned to the CES, they were checked for general sense and consistency and then coded before the resulting information was entered into a computer database.

Two years later, in 1979, the CES conducted another survey. The target population was all those young people who left Scottish schools in the 1977/78 session and the sampling frame was constructed in the same way as in 1977. This time the sampling fractions were 10% for qualified school leavers, i.e. school leavers with at least one O Grade pass, and 20% for the unqualified, i.e. the non-certificated and those with fails at O Grade. This time, the unqualified were included in all the regions of Scotland. The questionnaires sent to the unqualified included new items on: job seeking, early employment experience and experience of the Youth Opportunities Programme.

The 1981 survey had as its target population all those young people who left Scottish schools in the 1979/80 session. The sampling frame was constructed by the SED (which had discontinued its own survey in 1978) which asked schools to provide details on all those pupils eligible to leave in the 1979/80 session and whose birthday fell in an odd numbered day of the month.

This group represented 51% of all school leavers. Problems with obtaining details concerning pupils from schools and the decision by some pupils not to co-operate reduced the target sample to 43% of the target population. Postal questionnaires were despatched to the school leavers on Thursday 16th April 1981.

The 1983 survey had as its target population all those young people who left school during the 1981/82 session. The sampling frame was constructed in the same way as in 1981, but with the important difference that this time young people were not given the option to withhold their cooperation. This change was prompted by the discovery that certain schools were instructing their pupils to withhold their cooperation. The sampling fraction for this survey was 10% and the questionnaires were despatched in March 1983.

1.7.3. The Design of The Scottish School Leavers Surveys 1977 to 1983

The Scottish School Leavers Survey was designed to be double-phased, proportionately stratified, and to involve replicated sampling. The survey instrument was a postal questionnaire.

The double-phased element related to the fact that individuals to be included on the sampling frame were chosen in two stages: firstly, the SED and Local Education Authorities (in 1977 and 1979 only) provided a list of names and, secondly, the CES chose which school leavers to actually contact.

The proportionately stratified element refers to the fact that the sample of school leavers was stratified by gender, educational qualifications and region. These factors were known to be correlated with many of the survey variables. Explicit stratification of the sample with respect to gender, educational qualifications and region (and approximate proportional stratification by school) allowed the survey estimates to be more precise than would have been the

case if school leavers had been selected at random.

The replicated sampling element relates to the fact that different groups of school leavers were sent different questionnaires. Furthermore, each questionnaire came in a number of different versions. Each version of each questionnaire contained a subset of core questions, which were the same in each version of each questionnaire. This core set of questions provided the replicated sampling element of the SSLS. Table 1.6 shows the structure of the 1977, 1979, 1981 and 1983 questionnaires.

The survey instrument used in the SSLS's was a postal questionnaire. Since, between 1977 and 1983, 76 different questionnaires were produced, it is not possible to provide copies here. Instead, Table 1.7 provides a list of the subject headings of questions asked in each SSLS. It can be seen from Table 1.7 that the questionnaires contained a large number of questions concerning: examinations sat, school curriculum, ways of studying, attitudes and reactions to the school experience, further education (perceptions, attitudes, applications and actual destinations), family background, i.e. number of siblings, father's employment, father's occupation etc; employment experiences, i.e. labour market destinations, occupation and industry of employment etc; experience of unemployment, experience of state schemes for the young unemployed, etc.

Between 1977 and 1983, the nature of the questions asked in the surveys changed: the questions on labour market experience tended to become more numerous and detailed, as organisations, such as the Manpower Services Commission, began to become increasingly involved in funding the CES and the surveys, and as conditions in the market for school leavers' labour deteriorated.

Table 1.6: The Structure of The 1977, 1979, 1981 and 1983 Scottish School Leavers Survey

Survey:	1977	1979	1981	1983
Questionnaires:	1. After Highers (Eight Versions) For those pupils who had presented for Highers	1. After Highers (Two Versions) For those leavers who had presented for Highers	1. A (Eight Versions) For those leavers who, in Nov 1979, had not intended to sit for O Grades	1. A (Four Versions) For those leavers who did not study for O Grade and/or O Level examinations
	2. After School (Eight Versions) For those pupils who had presented for O Grades but not Highers	2. After School (Two Versions) For those leavers who had presented for O Grades but but not Highers	2. B (Eight Versions) For those leavers who, in Nov 1979, had intended to sit for O Grades, but who eventually did not do so	2. B (Four Versions) For those leavers who studied for O Grades and/or O Levels but did sit for them
	3. Non-Certificate (Five Versions) For pupils who had not presented for examination at any level	3. Non-Qualified (Three Versions) For those leavers who had not presented for examination at any level	3. C (Eight Versions) For those leavers who sat for O Grades but who had not, in Nov 1979, intended to sit for Highers	3. C (Four Versions) For those leavers with O Grades and/or O Levels as their highest qualification
			4. D (Eight Versions) For those leavers who, in Nov 1979, had already sat or intended to sit for Highers	4. D (Four Versions) For those leavers who studied for Highers and/or A Levels

Source of details: CES (1979, 1981, 1984 and 1986).

Table 1.7: Question-Type Headings for The Variables Included in The SEDA Data Sets for 1977, 1979, 1981 and 1983

1977	1979	1981	1983
Personal and background variables	Personal and background variables	School Background	YOU AND YOUR SCHOOL
School details	School details	Personal and Family Background	FOURTH YEAR AND EXAMS
Curriculum and attainment: all SCE levels	Curriculum and attainment: all SCE levels	School: Curriculum and Examinations	THIRD AND FOURTH YEAR SUBJECTS
Curriculum and attainment: SCE O grade	Curriculum and attainment: SCE O grade	School: General Experience	STAYING ON
Curriculum and attainment: SCE H grade	Curriculum and attainment: SCE H grade . . .	School to Post-School: Transition	FIFTH AND SIXTH YEAR COURSES
Curriculum and attainment: SYS, GCE and CSE	Curriculum and attainment: SYS, GCE and CSE	Post-School: General	FIFTH AND SIXTH YEAR COURSES
Non-examined curriculum	Non-examined curriculum	Post-School: Formal Education	APPLYING FOR COLLEGE
Views on Science	Views on Science	Post-School: General	COLLEGE
Subject choice in S3	Subject choice in S3		AFTER SCHOOL
New subjects taken up after S3 (AH)	New subjects taken up after S3 (AH)		WORK
Methods of studying	Methods of studying		FAMILY
The school timetable (AH)	The school timetable (AH)		
Behaviour and attitudes to school and teachers	Behaviour and attitudes to school and teachers		
Views on exams	Views on exams		
The decision to leave school	The decision to leave school		
The sixth year and Sixth Year Studies (AH)	The sixth year and Sixth Year Studies (AH)		
Local amenities: leaving home	Local amenities: leaving home		
Vocational preparation	Vocational preparation		
Aspirations and attitudes on jobs and education	Aspirations and attitudes on jobs and education		
Knowledge and perceptions of different sectors of Higher Education (AH)	Knowledge and perceptions of different sectors of Higher Education (AH)		
Applying to further education: reasons, choices, preferences	Applying to further education: reasons, choices, preferences		
Looking for jobs	Looking for jobs		
How present job was obtained	How present job was obtained		
Post-school destination: general	Post-school destination: general		
Details of present full-time occupation	Details of present full-time occupation		
Post-school education: summary variables	Post-school education: summary variables		
Post-school education: details	Post-school education: details		
Plans for future post-school courses	Plans for future post-school courses		
	Job search		
	First job		
	Youth Opportunities Programme		

Source: CES (1977, 1979, 1981, 1983)

1.7.4. Sampling Fractions and Response Rates

Table 1.8 shows the population of school leavers in Scotland, the intended sampling fraction, the achieved sampling fraction, the overall response rate and the response rate broken down by questionnaire type for the 1977, 1979, 1981 and 1983 SSLS's. It can be seen from Table 1.8 that the overall response rate was high, i.e. between 78% and 86%, for every SSLS, and was particularly high for a postal survey. It can also be seen from Table 1.8 that the response rate was positively related to leaver's educational attainment, for each survey between 67% and 75% for the unqualified and between 86% and 94% for those with Highers. Since the response rate, as defined in Table 1.8, is based on questionnaires despatched, rather than on school leavers actually contacted, the true voluntary response rates were, in fact, higher than those shown in Table 1.8. Unfortunately, the data relating to response rates on contacts was only available for 1977 and 1979.[13]

1.7.5. An Appraisal of The SEDA Data Set

Until the launching of The England and Wales Youth Cohort Study in 1985, the SSLS survey was by far the most detailed survey specific to young people in Britain.[14] It was not the largest survey of young people in the period covered by this Thesis, The New Entrants to Employment Survey was. However, The New Entrants to Employment Survey was restricted to employed school leavers and those on schemes for the unemployed (until 1983) in England and Wales, and did not produce many items of information and had an unusual sample reporting arrangement.[15] The only items it contained information on were: school leaver's industry and occupation of employment, apprenticeships and length of training and educational qualifications. There were surveys in 1978, 1979, 1980 and 1983. The survey was discontinued in 1983 and was replaced by The England and Wales Youth Cohort Study.

Table 1.8: The Target Populations, Sampling Fractions and Response Rates in 1977, 1979, 1981 and 1983

Survey:		1977	1979	1981		1983	
Target Population		91,000	93,200	91,700		88,600	
		%	%	%		%	
Intended Sampling Fraction[1]		40	20% of Unqualified, 10% of Rest	51		10	
Achieved Sampling Fraction		31	13% of all school leavers	43		8	
Overall Response Rate:[2]		82	78	86		81	
Response Rate by Questionnaire:							
(As % of Target Sample)	1. After Highers	86	1. After Highers 94	1. A	67	1. A	75
	2. After School	82	2. After School 93	2. B	74	2. B	74
	3. Non-Certificate	71	3. Non-Qualified 70	3. C	94	3. C	80
				4. D	94	4. D	86

(1) The achieved sampling fraction differed from the intended sampling fraction because of problems in getting the details from schools concerning some leavers. The effective sampling fraction was calculated using the number of questionnaires despatched and the target population.

(2) The response rates are defined as the percentage of questionnaires despatched which were returned.

In the late 1970's and in the 1980's a large number of special studies of young people in the labour market were undertaken (see Greaves (1985) for a review of Department of Employment sponsored studies) perhaps the best known being those undertaken by Ashton *et al.* (1982), Ashton *et al.* (1986) and Roberts *et al.* (1986). Such studies tended to be conducted using a smaller number of young people than included in the SSLS's and tended to be restricted to limited geographical areas and short time periods. They also collected a smaller range of information than the SSLS's. Such studies were thus more limited than the SSLS's.

To conclude, its unique combination of size and detail make the SEDA data set a valuable and unequalled source of information concerning young people's changing labour market experiences in the traumatic years of the late 1970's and early 1980's. Consequently, it has a great deal to offer the researcher, although it is not without its shortcomings. Its principal shortcomings with regard to the analysis contained in this Thesis, are: firstly, its lack of wage data until 1983, and, secondly, during the period covered by this Thesis, the lack of a cohort element. Despite the restrictions imposed on the analysis by these two shortcomings, the SEDA data set still provides plenty of scope for worthwhile and interesting analysis of Scottish school leaver's labour market experiences.

1.8. The End of The Beginning

This Chapter has set the scene for the rest of the Thesis and given a glimpse of the shape of things to come. Furthermore, in the course of this Chapter it has been seen that something quite dramatic occurred to school leavers' employment between 1977 and 1983. The SEDA data set is unequalled in its ability to yield information on school leavers' employment and it is to the use of the SEDA data set in the examination of the industrial dimension of

Scottish school leavers' employment that we now turn.

Footnotes

1. The author has, however, undertaken work with Dr Brian Main on the analysis of school leavers' wage data from the 1985 and 1986 Scottish Young Peoples Surveys, which have larger sample numbers than the 1983 data set.

2. See Metcalf (1982) and Greaves (1985) for reviews of those studies.

3. See Ashton and Maguire (1983) for one account of the structural explanation of the decline in young peoples' employment and Main and Raffe (1983a) for an earlier version of the analysis contained in Chapter Five and an account that stresses young peoples' vulnerable position in the labour market.

4. See NYEC (1974), Ashton and Maguire (1983), Roberts (1986) and Roberts *et al.* (1986) for accounts that stress changes in the occupational structure. See Raffe (1984b) and Main (1985a) for accounts that attribute the decline in unqualified and less qualified school leaver's employment prospects to the raising of hiring standards.

5. In British unemployment statistics, school leavers are defined as under 18 year olds who have not entered a job since leaving school. In 1981, benefit entitlement regulations were changed so that school leavers were not entitled to Supplementary Benefit until the September after leaving school. This may have led to later registration on the part of school leavers. In October 1982, the unemployment count was switched from a registrant count to a claimant count. This may explain the apparent downturn in school leaver unemployment between 1982 and 1983. Finally, the monthly average figure for 1976 was calculated using ten month's data to take into account the loss of two month's data due to industrial action.

6. The State schemes considered for the purposes of Figure 1.2 were: The Recruitment Subsidy for School Leavers (June 1976 only), The Youth Employment Subsidy (included December 1976 to June 1978), The Work Experience Programme (December 1976 to December 1977), Training Places Supported in Industry (December 1976 to September 1983), Training Services Division Special Courses for Young People (June 1976 to December 1977), The Youth Opportunities Programme (June 1978 to December 1983), The Young Workers Scheme (June 1982 to December 1983) and, finally, The Youth Training Scheme (June and December 1983).

7. The following discussion is the author's own version of the demand deficiency explanation and is somewhat more detailed than that provided in Main and Raffe (1983a), Raffe (1984a,b) and Main (1986).

8. See Hart (1984b) for another account of the econometric studies of the time-series relationship between young peoples' relative pay and employment or unemployment.

9. Merrilees and Wilson (1979) claim that until the late 1960s/early 1970s, the youth labour market appeared to be in a situation of excess demand. Four main features of the market seemed to indicate this.

   Firstly, until the late 1960s, total vacancies for young people exceeded their

unemployment total. However, both these figures have various problems attached to their interpretation. Measures of unemployment are not particularly reliable as indicators of conditions in the labour market, firstly, because unemployment totals tend to be affected by the economic cycle via changes in participation rates, secondly, there have been frequent changes in the official definition of unemployment and, finally, registered unemployment is affected by firm's hoarding or dishoarding of labour, which is in turn influenced by secular changes in the fixed costs of labour (see Nickell, 1984). The main problem with the vacancies figures is that changes in the behaviour of government employment agencies in recent years may have caused the proportion of vacancies notified to these agencies to increase over time, and this may have led to a spurious increase in *registered* vacancies.

Secondly, Merrilees and Wilson (1979) point out that throughout the post-war period, until the late 1960s, The Youth Employment Service reported chronic shortages of young people, relative to demand.

Thirdly, they point out that the "baby boom" generation of the 1960s passed into the labour market without any concomitant increase in youth unemployment.

Finally, they claim that until the late 1960s, the share of young people in total unemployment showed no secular increase.

Moreover, there are good reasons to believe that the period since the late 1960s/early 1970s has been characterised by excess supply in the youth labour market. Firstly, after that time, young people dramatically increased their share of total unemployment. Secondly, the "baby boom" generation that came onto the labour market in the mid and late 1970s did so to the accompaniment of both rising youth unemployment and rising relative youth pay, a combination one would not expect to observe if the youth labour market were in a situation of equilibrium (Wells, 1983). Finally, during the late 1970s/early 1980s young peoples' relative pay first stabilised and then declined (Wells, 1984) yet it seems that this period was the one in which young peoples' employment fell most dramatically.

10. The details contained in this section are taken from CES (1979, 1981, 1984 and 1986).

11. The Scottish Higher Certificate of Education is more advanced than the O Levels sat by pupils in England and Wales but not as advanced as A Levels. Pupils can sit for Highers in their fifth or sixth form (corresponding to the English lower and upper sixth years). Pupils usually take Highers in their fifth form.

12. O Grades are the Scottish equivalent of O Levels.

13. The overall response rates on contacts were 86% and 83% in 1977 and 1979, respectively (CES; 1977, 1979).

14. The England and Wales Youth Cohort Study is a study of 16 to 19 year olds conducted by Social and Community Planning Research, the aims of which are, firstly, to monitor young people's decisions and behaviour as they decided whether to continue in education or not at the end of their

compulsory secondary schooling and, secondly, to monitor the decisions, behaviour and experiences of those young people who entered the labour market (Courtenay, 1986). The chosen survey instrument was a postal questionnaire. The target population consists of those young people who reached minimum school leaving age in the relevant academic year, i.e. 1983/84 for the first cohort. The sampling frame is provided by The Department of Education and Science from the pupil rolls of maintained schools.

The first survey was conducted in 1985 and related to those who had reached the age of 16 before 31st August 1984 and whose birthday fell on 5th, 15th and 25th of each month. Postal questionnaires were sent out to approximately 12,500 young people in May 1985. This yielded 8064 work responses.

In 1986, a second cohort was surveyed for the first time and the first cohort was surveyed for the second time. In 1987, the third cohort was surveyed for the first time, the second cohort for the second time and the first cohort for the third time.

15. The New Entrants to Employment Survey was a survey of school leavers in England and Wales conducted by the Department of Employment. The first survey was conducted in 1978. There were other surveys in 1979, 1980 and 1983. This particular survey was discontinued after 1983. (Department of Employment, 1980b, 1982, 1984a, 1984b.)

    The survey derived its statistics from the records of local authority Careers Offices throughout England and Wales. The sample members consisted of all those school leavers who reached the minimum leaving age during the survey year, i.e. those persons whose birthdays fell between 1st September and 31st August, and whose birthdays fell on the 5th, 15th and 25th of the month and who were recorded, as being in work on, or before, 31st December in the year in which they left school.

    Careers offices provided the bulk of the sample, i.e. 92, 89, 90 and 100 per cent of the sample in 1978, 1979, 1980 and 1983, respectively. The achieved sample was approximately 10 per cent of the target population in each year. The number of employed school leavers sampled were: 45511, 43306, 35614 and 30821 for the 1978, 1979, 1980 and 1983 surveys, respectively. No surveys of 16 year old school leavers were conducted in 1981 and 1982.

    The data collected related to school leaver's: industry of employment, occupation, length of training, apprenticeships and educational qualifications. The latter refers to the number of O Levels at grades A-C and the number of CSE's at grade one (equivalent to an O Level "C"). In 1983, the data related to non-YTS employment only, previously YOP participants had been included alongside the employed.

    The sampling procedure was as follows. Those who left school at age 16, and obtained work by the end of the survey year were recorded as 16 year old school leavers for survey year t. Those who left school in the following year, aged 17, and found work by the end of that year, were recorded as 17 year old school leavers for survey year t. Finally, those who left school aged 18, i.e. two years after the survey year, and found

employment by the end of that year, were recorded as 18 year old school leavers for survey year t. This survey design feature meant, for instance, that the data from the 1978 survey actually referred to 1978, 1979 and 1980. Given the changes in school leaver's employment prospects during that period, this obviously caused some confusion between the employment situation facing school leavers of different ages and changes in the employment situation facing all school leavers. A different arrangement was used for compiling the figures in 1983. In that year only 16 year old school leavers were included.

CHAPTER 2

THE CHANGING INDUSTRIAL DISTRIBUTION OF SCOTTISH SCHOOL LEAVERS' EMPLOYMENT, 1977-83

2.1. Introduction

2.1.1. Preview

The contents of this Chapter consist of an examination of Scottish school leavers' industrial distributions of employment in each of the four years covered by the Scottish School Leavers Surveys, i.e. 1977, 1979, 1981 and 1983 (hereafter referred to as "the survey years"), the examination of the changes in school leavers' industrial distribution of employment over the period 1977 to 1983, and, finally, an examination of the industrial pattern of school leavers' absolute change in employment between 1977 and 1983. The various parts of the examination are conducted for both genders considered together and each gender considered separately.

The discussion in this Chapter centres around three themes: firstly, the differences between male and female school leavers' industrial distributions of employment and employment change, secondly, the shift in school leavers' employment toward the service sector at the expense of the manufacturing industries and the extent to which it reflected trends in all ages' employment, and, finally, the industrial pattern of school leavers' employment change and the extent to which the decline in their employment was concentrated in just a few industries.

2.1.2. Why Study Scottish School Leavers' Industrial Distribution of Employment?

There are three main justifications which may be given for an examination of Scottish school leavers' industrial distribution of employment. The first is

that there has been a great deal of governmental concern about, and public resources committed to, tackling the problem of youth joblessness in recent years. Increasingly, the Government has come to regard the adequate training of young people as a vital policy aim.[1] If young people are to be trained, the question arises as to what training they should receive. The proper functioning of government-sponsored training schemes for young people, such as The Youth Training Scheme, requires information concerning the type of work employed young people do and in which industries they work.

The second justification has to do with the fact that a study of school leavers' changing industrial distribution of employment can throw light upon wider industrial trends. Since firms typically respond to a decline in their sales by curtailing recruitment (see Chapters One and Five), a marked decline in school leavers' employment in an industry will be amongst the first indications that that industry is ailing. Furthermore, since an industry which is expanding will require new recruits, an increase in school leavers' employment might be an early indicator of which industries are experiencing growth.[2] Hence, changes in school leavers' employment may provide an early indication of industrial change.

The third, and final, reason for studying Scottish school leavers' industrial distribution of employment has to do with a possible concern for the quality of their employment and the level of youth unemployment.[3] If school leavers were confined to industries in which adult rates of pay were low and training opportunities were few, then, the quality of their employment would be low and their job turnover rate would probably be high,[4] thus increasing the level of youth unemployment. On the other hand, if school leavers have access to jobs in a wide range of industries, including those which offer training, then the quality of their employment would be higher and they might be expected to

display greater employment stability, thus reducing the level of youth unemployment.

Despite the justifications given above, the study of young peoples' industrial distribution of employment has received very little attention.[5] The intention in this Chapter is to use data from the Scottish Education Data Archive (SEDA) data set in order to help to rectify this deficiency.

2.1.3. The Rest of The Chapter

The general outline of the rest of the Chapter is as follows. Section 2.2 examines secular trends in all ages' industrial distribution of employment and the recent changes in all ages' industrial distribution of employment in Scotland. Section 2.3 contains a short review of the literature pertaining to the causes of the secular changes in all ages' industrial distribution of employment. The review is provided to better inform the discussion of Scottish school leavers' industrial distribution of employment, in each of the survey years, which is contained in Section 2.5. Section 2.6 contains an examination of the industrial pattern of the changes in Scottish school leavers' absolute employment over the period 1977-83. Concluding remarks are contained in Section 2.7.

2.2. Trends in the Industrial Distribution of All Ages' Employment

2.2.1. Long Term Trends in The Industrial Distribution of All Ages' Employment

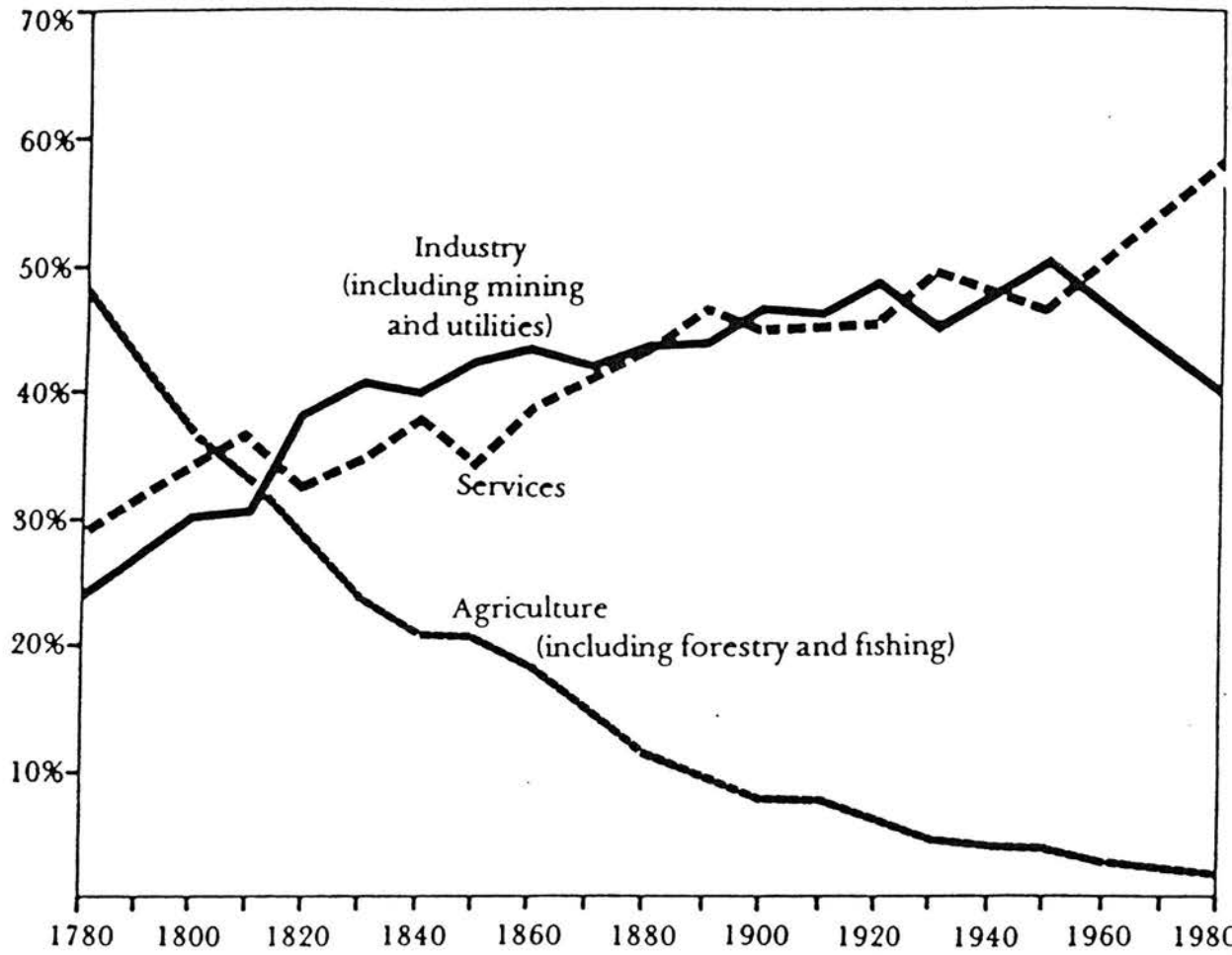
Figure 2.1,[6] taken from Jones (1982), shows the industrial distribution of all ages' employment in Great Britain between 1780 and 1980. It can be seen from that figure that the major trend over the entire period was a shift away from agriculture and towards industry and services. Since approximately 1950, the share of industry in all ages' total employment can be seen to have declined, whilst the share of services increased. This is *the* major post-war change in all ages' industrial distribution of employment. Table 2.1, which is taken from Kendrick (1984), shows the industrial distribution of all ages' employment in Scotland between 1851 and 1981.[7] It can be seen from that table that the share of agriculture in all ages' total employment declined throughout the period. The share of manufacturing was relatively steady between 1851 and 1951 and declined thereafter. The employment share of services can be seen to have increased noticeably after 1961, and particularly after 1971. So, the long term trends in the industrial composition of all ages' total employment in both Great Britain and Scotland have been very similar and consisted of a very long term shift away from agriculture and towards industry and services, and, since about 1950, a shift away from industry and towards services.

2.2.2. The Level of Employment Within Industrial Sectors

Turning to a consideration of the absolute levels of employment in each industrial category, Figure 2.2, taken from Parsons (1985), shows total employment in Great Britain, between 1841 and 1983, broken down into employment in the production,[8] service and agricultural industries. It can be seen from the figure that employment in agriculture has declined since 1851. Figures 2.3(a) and 2.3(b), again taken from Parsons (1985), show employment in

Figure 2.1

Employment trends in Great Britain since 1780, by three sectors



Note: The figures for the earlier years are approximate, following Cipolla, Hartwell and Kuznets, to illustrate trends. These trends appeared *first* in Britain, and similar graphs – with later starting dates – could be drawn for Belgium (from 1825), the United States (1830–40), France and Australia (1850–70). The lines indicate general trends only. The figures after 1801 are based on the analysis by Deane and Cole of census returns and refer only to persons actually employed (the unemployed are not counted and the huge dislocations caused during World Wars I and II are disregarded).

Source: Jones (1982), Figure One

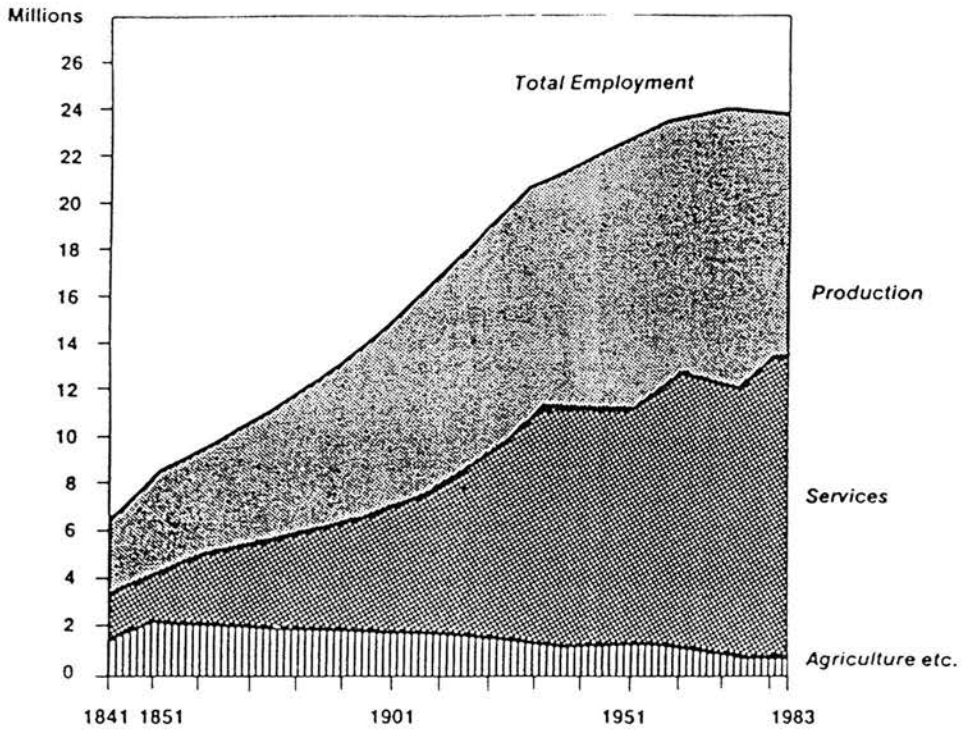
Table 2.1

SCOTLAND, EMPLOYMENT BY SECTORS, 1851 TO 1981

	Agri-culture	*Mining & quarrying*	*Manufac-turing*	*Construc-tion*	*Inter-mediate*	*Service*
Series A						
1851	26.0	4.4	43.2	5.5	5.0	15.9
1871	23.6	5.6	40.9	6.6	6.5	16.8
1891	15.3	6.3	43.2	6.4	9.3	19.6
1911	11.4	8.7	43.9	6.0	10.3	19.8
Series B						
1911	11.8	8.0	36.5	5.9	18.5	19.3
1931	10.1	6.0	30.3	4.2	25.4	24.0
1951	7.4	4.5	35.1	6.9	21.9	24.1
1961	5.8	3.9	32.5	7.9	23.7	26.2
1971.A	4.1	1.7	32.2	8.2	21.0	32.8
June 1971	2.7	1.9	33.4	7.9	20.6	33.4
June 1981	2.3	1.9	25.4	7.5	19.8	43.1

Source: Kendrick (1984), Table 1

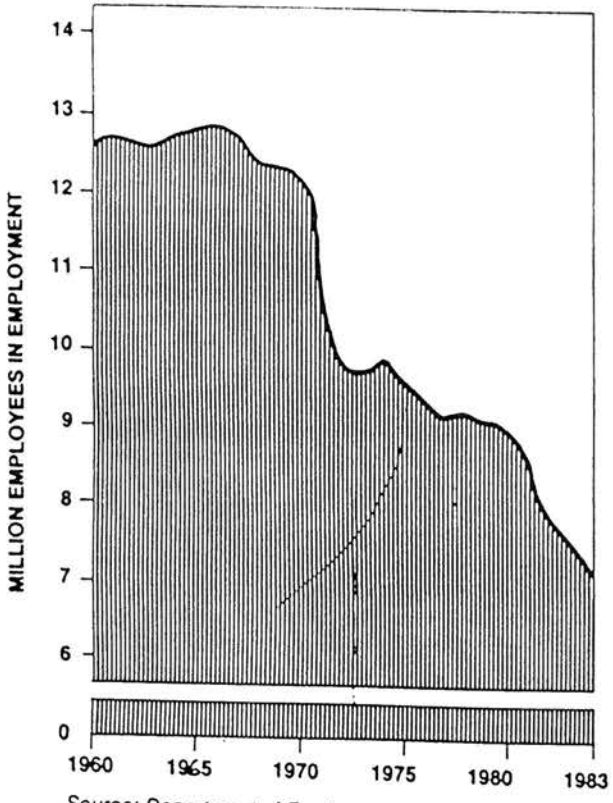
Figure 2.2 **Employment in Great Britain, 1841-1983**



Source: Historical Abstract of Labour Statistics, Department of Employment + IMS estimates

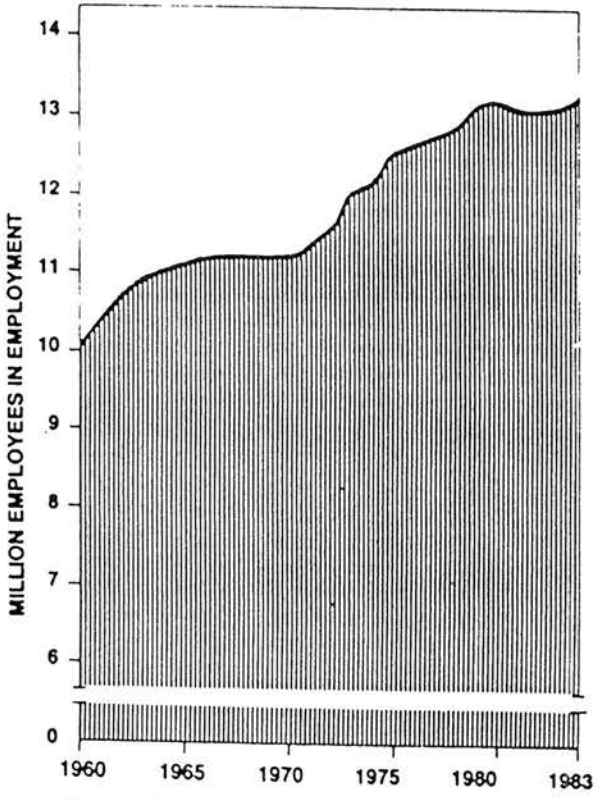
Source: Parsons (1985), Figure 1.1

Figure 2.3a **Employment Change in Production Industry, GB: 1960-83**



Source: Department of Employment

Figure 2.3b **Employment Change in Service Industries, GB: 1960-83**



Source: Department of Employment

Source: Parsons (1985), Figures 3.2 & 3.3

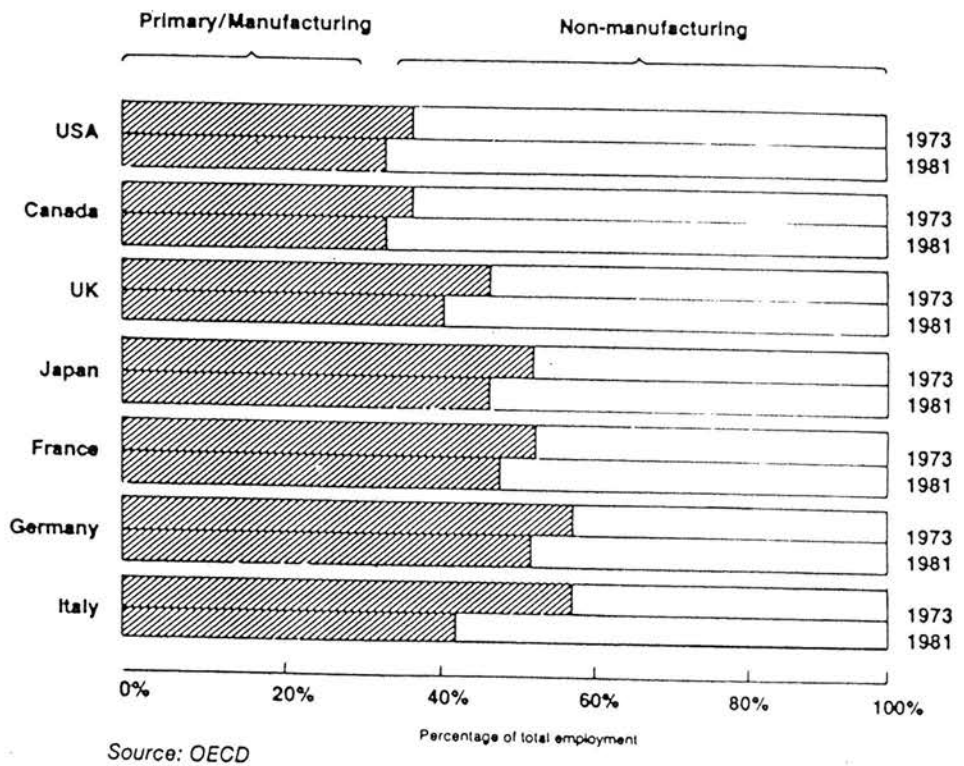
the production and service industries, respectively, in Great Britain, over the period 1960 to 1983. It can be seen from Figure 2.3(a) that employment in the production industries has declined since the late 1960's. From Figure 2.3(b), it can be seen that employment in the service industries grew steadily throughout the period, with the exception of a short period of employment decline in the early 1980's.

The recent shift of all ages' employment towards the service industries and away from other industries, particularly manufacturing, is not a solely British or Scottish development. Rather, it is feature common to advanced capitalist economies. This is illustrated in Figure 2.4, again taken from Parsons (1985), which shows the industrial composition of total employment in seven Organisation for Economic Co-operation and Development countries, including the UK, in 1973 and 1981. It can be seen that there was a shift towards non-manufacturing, i.e. services, in each of the countries between 1973 and 1981.

2.2.3. Individual Industries Within The Manufacturing, Production and Service Sectors

Turning now to a consideration of the changes in all ages' employment in individual manufacturing and service industries, Figure 2.5, taken from The Institute for Employment Research's "Economic Review" (IER, 1985), shows the absolute change in employment in sixteen industrial categories, over the period 1950 to 1980, and, the predicted changes over the period 1980 to 1990. Figure 2.6, taken from Parsons (1985), shows the absolute employment change in twenty-four industrial categories over the period 1971 to 1983. Finally, Table 2.2, taken from Kendrick (1984), shows employment in thirteen industrial categories, in Scotland, between 1971 and 1982.

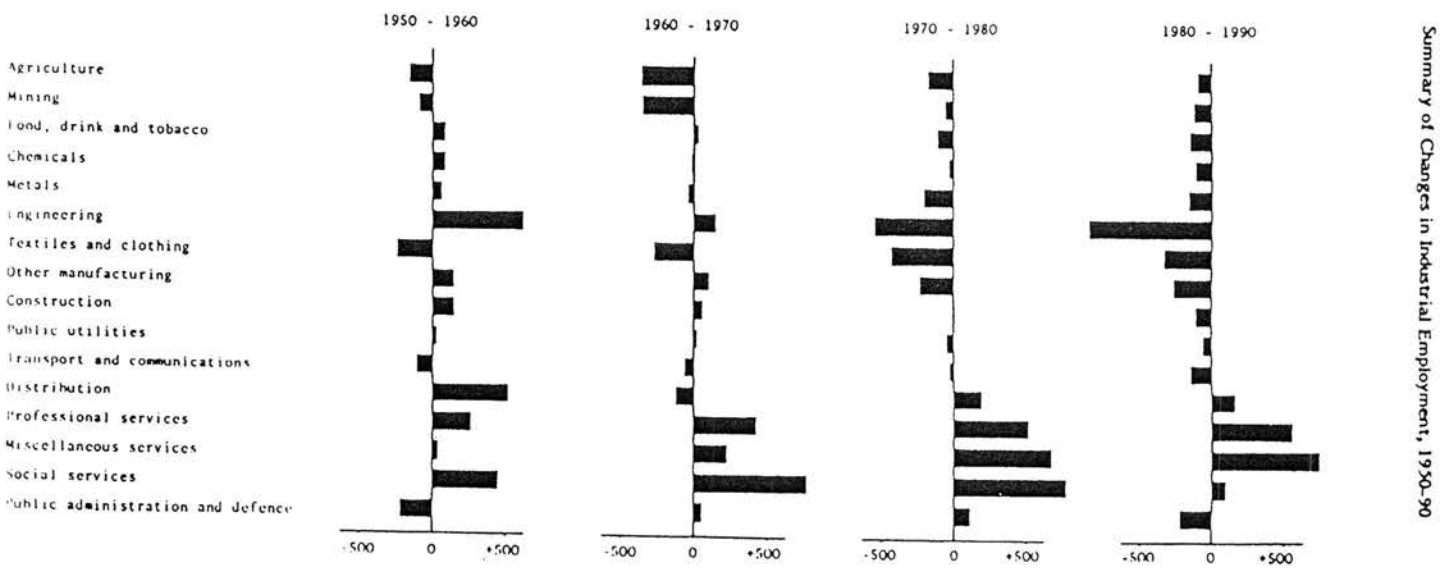
Figure 2.4 **Employment Shifts in Selected OECD Countries, 1973 and 1981**



Source: OECD

Source: Parsons(1985), Figure 3.1

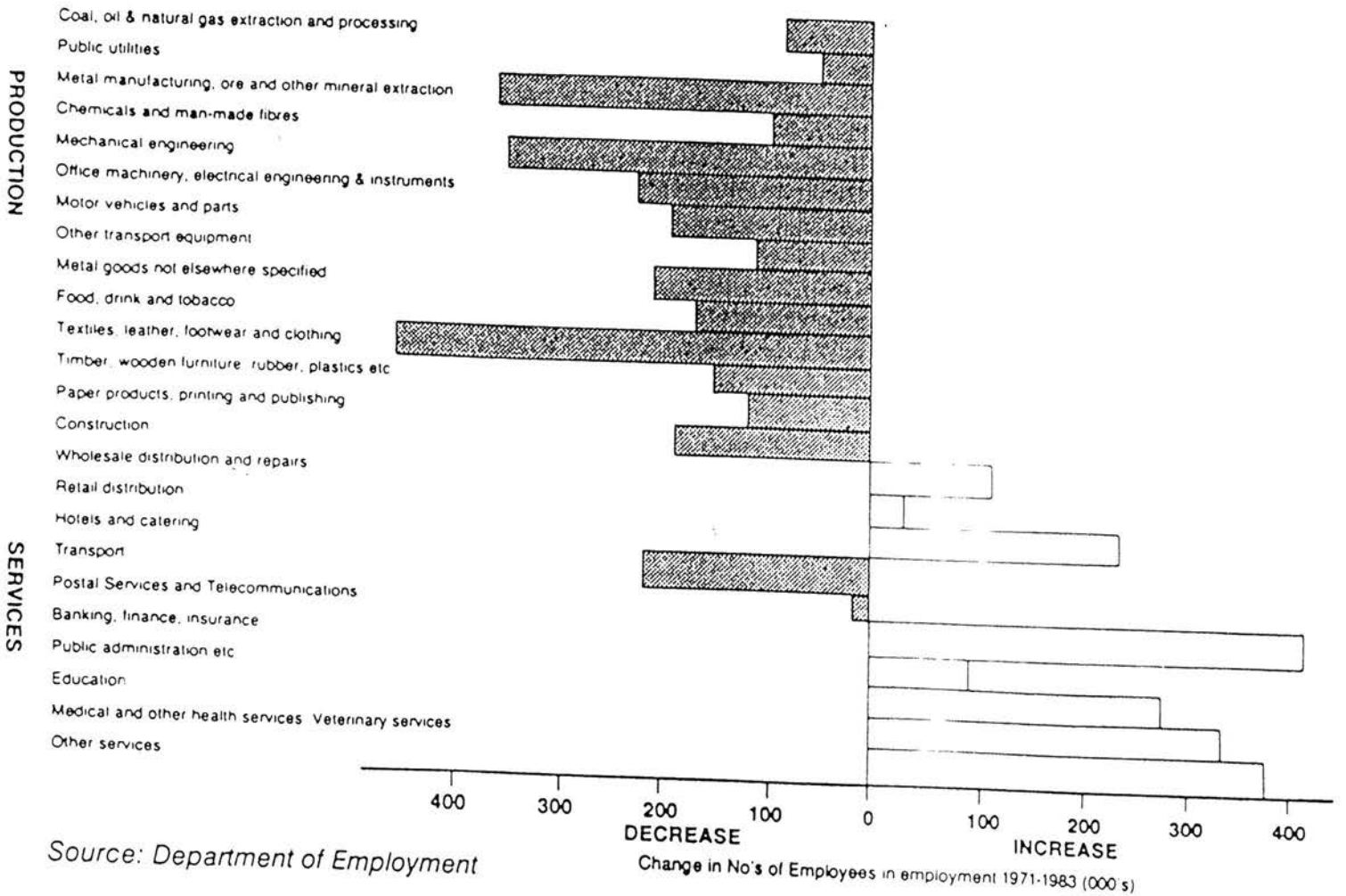
Figure 2.5



Summary of Changes in Industrial Employment, 1950-90

Source: IKR(1985)

Figure 2.6 **Employment Change in Services and Production Industries 1971-1983**



Source: Department of Employment

Source: Parsons(1985), Figure 3.4

Table 2.2

EMPLOYEES IN EMPLOYMENT BY INDUSTRY, JUNE 1971 TO JUNE 1982

Industry						
1. Agriculture, forestry, fishing	55	50	47	45	44	-12%
2. Mining and quarrying	39	34	38	41	42	+24%
4,5. Coal, petroleum and chem. prods.	31	31	34	30	29	-6%
6. Metal manufacture	46	43	32	28	26	-39%
7-12. Engineering and allied industries	276	287	226	199	185	-36%
13-15. Textiles, leather and clothing	106	106	82	71	66	-38%
16-19. Other manufacturing	113	111	90	79	75	-32%
20. Construction	159	179	161	144	130	-24%
21. Gas, electric, water	31	28	29	28	28	N.C.
22. Transport and comm.	143	139	133	127	123	-12%
23. Distribution	238	242	234	225	220	-9%
24-26. Financial, prof. & misc. services	538	599	696	682	679	+13%
27. Public admin. and defence	131	145	148	149	150	+3%
Total manufacturing	669	676	550	489	457	-32%
Manufacturing as percent of total	33.4	32.4	27.4	25.3	24.3	
Total employees	2003	2084	2036	1931	1872	-10%

Source: Kendrick(1984a), Table 4

It can be seen from Figure 2.5, that within the production industries, although the mining and quarrying, and, textile and clothing industries have experienced employment declines since 1950, it is only since 1970 that *all* the production industries have experienced employment declines, the largest of which have been in the engineering industries. Within the service industries, there have been continued employment increases, since 1950, in all the industries apart from the distribution industry, which experienced an employment decline in the 1960's. There have been particularly large and sustained increases in employment in social services and professional services. From Figure 2.6, it can be seen that between 1971 and 1983 there were particularly large employment declines in the metal-using, manufacturing industries, e.g. metal manufacture and engineering, and in the textile industry. The largest employment increases over the period were in the following service industries: banking, finance and insurance; education, and, medical and health services. From Table 2.2, it can be seen that, in Scotland, between 1971 and 1982, the largest increases in employment were in mining and quarrying (which includes North Sea oil production) and the financial, professional and miscellaneous services category. The largest decreases in employment were in the textile industry, the metal-using industries and construction.

2.2.4. The Changes in All Ages' Employment in Scotland 1976-83

The aim in this sub-section is to examine the changes in all ages' distribution of employment in Scotland, between 1976 and 1983, in some detail, since these changes represent the wider background against which the changes in Scottish school leavers' industrial distribution of employment took place.

Both Genders

Table 2.3 and Figures 2.7 to 2.13 show all ages' total employment and employment in six broad industrial categories in Scotland, for the period 1976–83, respectively. Table 2.4 shows the percentage of all ages' total employment in six broad industrial categories over the same period. Figure 2.14 shows this information graphically.

It can be seen from Table 2.3 and Figure 2.7 that, all ages' total employment in Scotland only began to decline in 1979, and that the largest single fall in all ages' total employment occurred in 1980. From Table 2.4 it can be seen that there was a 7.7 percentage point increase in the service industries share of all ages' total employment between 1976 and 1983. The manufacturing industries' share of all ages' total employment declined by 6.5 percentage points over the same period. So the major trend in the industrial distribution of Scottish all ages' employment between 1976 and 1983 was a shift towards the service industries and away from the manufacturing industries. This trend is shown graphically in Figure 2.14.

The net decline in all ages' total employment conflates a number of different experiences encountered by the individual industrial categories. To make this point more clearly, Table 2.5 shows the year by year and entire period, i.e. 1976–1983 net employment change, job loss and job gain figures in each of six broad industrial categories. It can be seen from that table that the manufacturing and construction industries accounted for the bulk of the entire period job losses, i.e. 70 percent and 20 percent respectively, and only a minute fraction of the entire period job gains, i.e. 8 percent and 4 percent respectively. The service industries accounted for the bulk of the entire period job gains, i.e. 83 percent, and only 10 percent of the entire period job losses.

Table 2.3

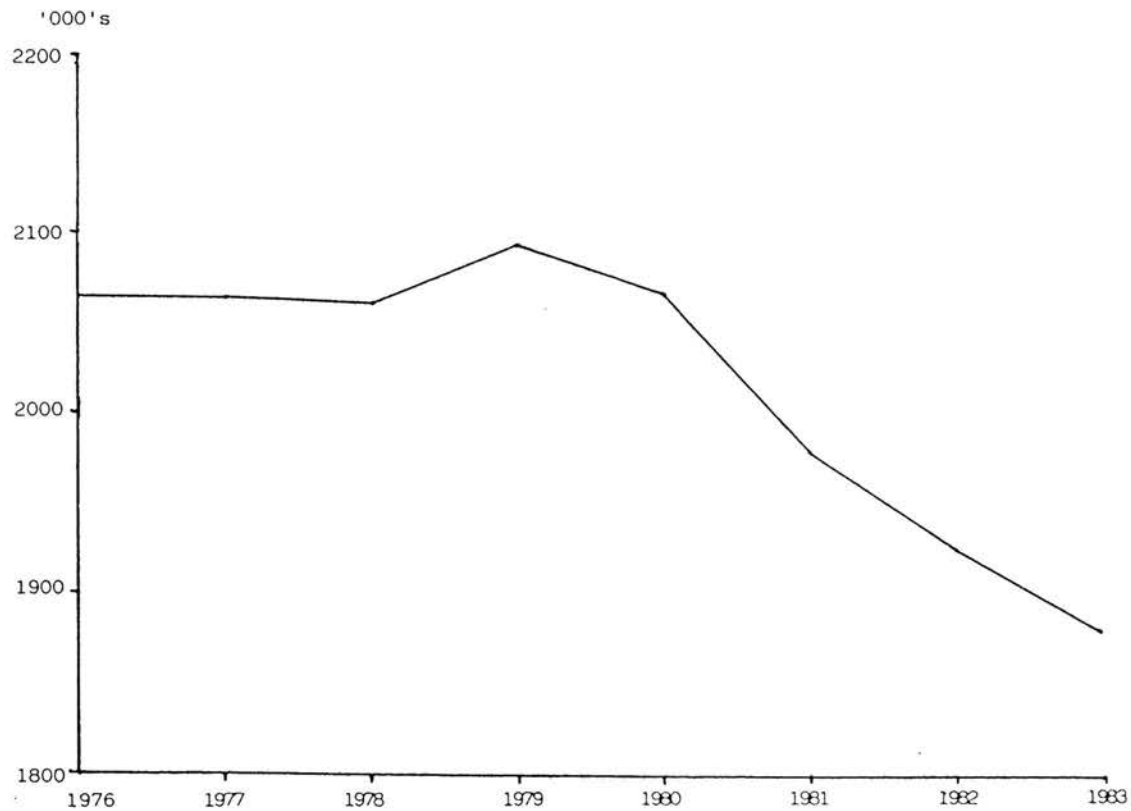
All ages total employment and employment in six industry groups, Scotland, 1976-1983 (Thousands)

	Orders (1968 SIC)	1976	1977	1978	1979*	1980*	1981*	1982*	1983*
I	Agriculture, Forestry and Fishing	49	49	48	48	45	45	44	43
II	Mining and Quarrying	35	36	39	43	44	43	44	44
III-XIX	Manufacturing Industries	608	615	604	598	554	495	463	431
XX	Construction	171	164	160	163	159	141	128	121
XXI	Gas, Electricity and Water	29	28	28	29	29	29	29	27
XXXII-XXVII	Service Industries	1179	1179	1188	1221	1243	1231	1224	1216
	TOTAL	2071	2071	2067	2101	2073	1983	1931	1882

* Note: These figures are provisional. All figures relate to June

Source: Scottish Abstract of Statistics, No 13, 1984, Table 9-3(a), pp57

FIGURE 2.7: TOTAL EMPLOYMENT IN SCOTLAND, 1976-83



SOURCE: SCOTTISH ABSTRACT OF STATISTICS, 1984.

FIGURE 2.8: AGRICULTURE, FORESTRY AND FISHING

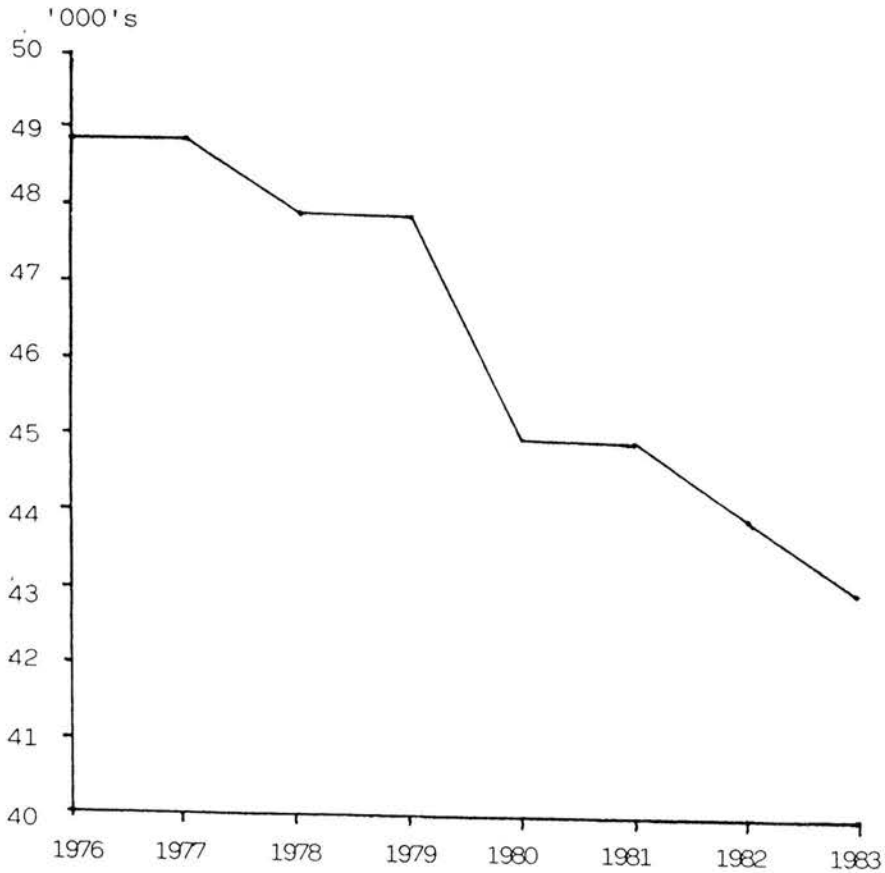
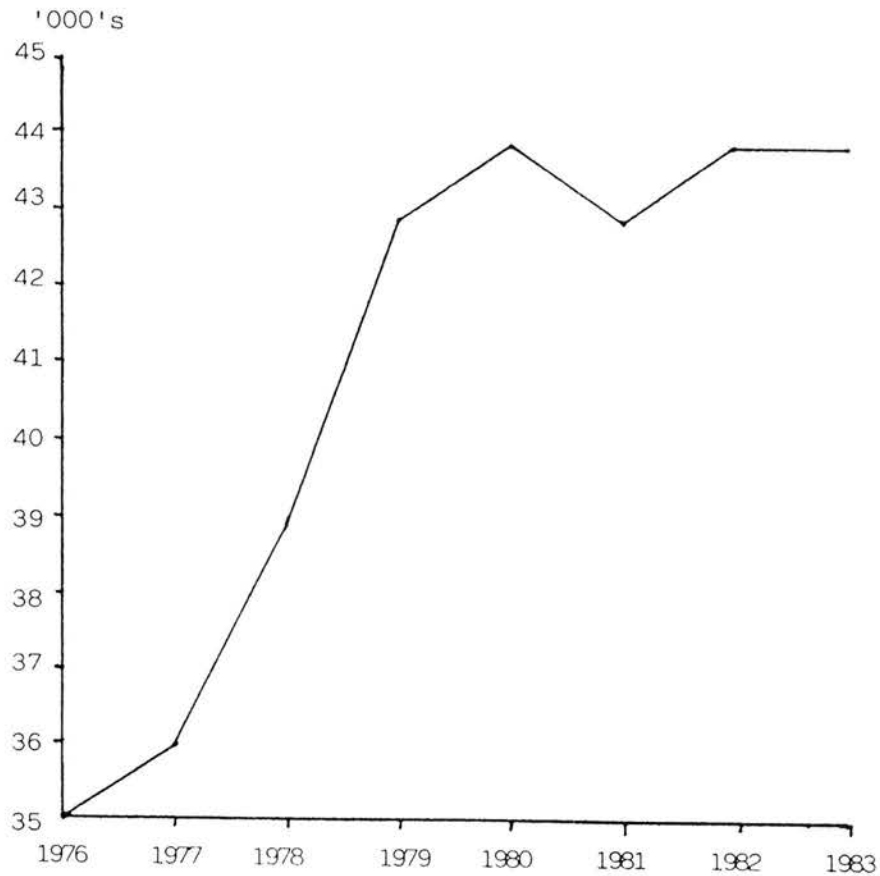


FIGURE 2.9: MINING AND QUARRYING



SOURCE: SAS OP CIT

FIGURE 2.10: MANUFACTURING INDUSTRIES

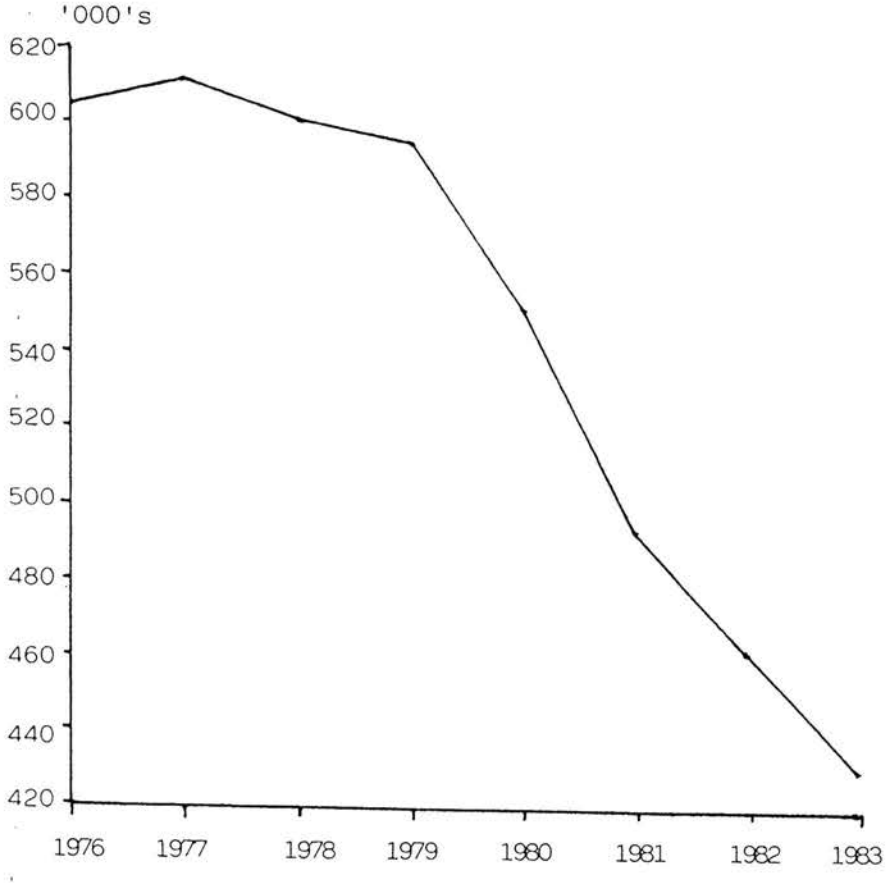
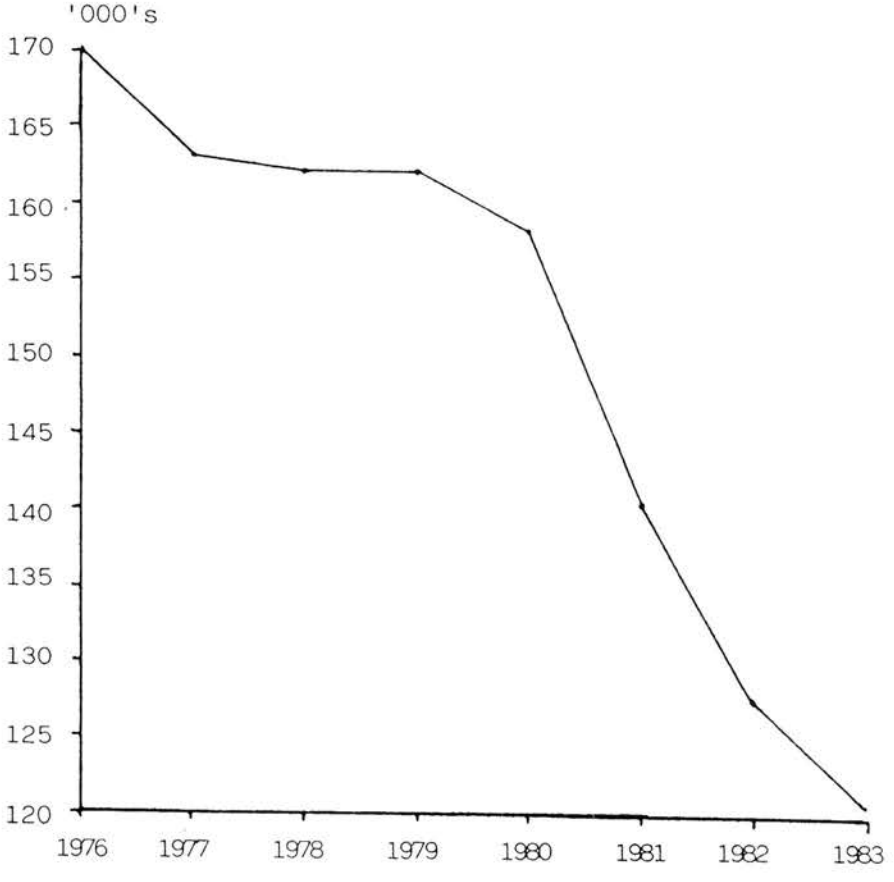
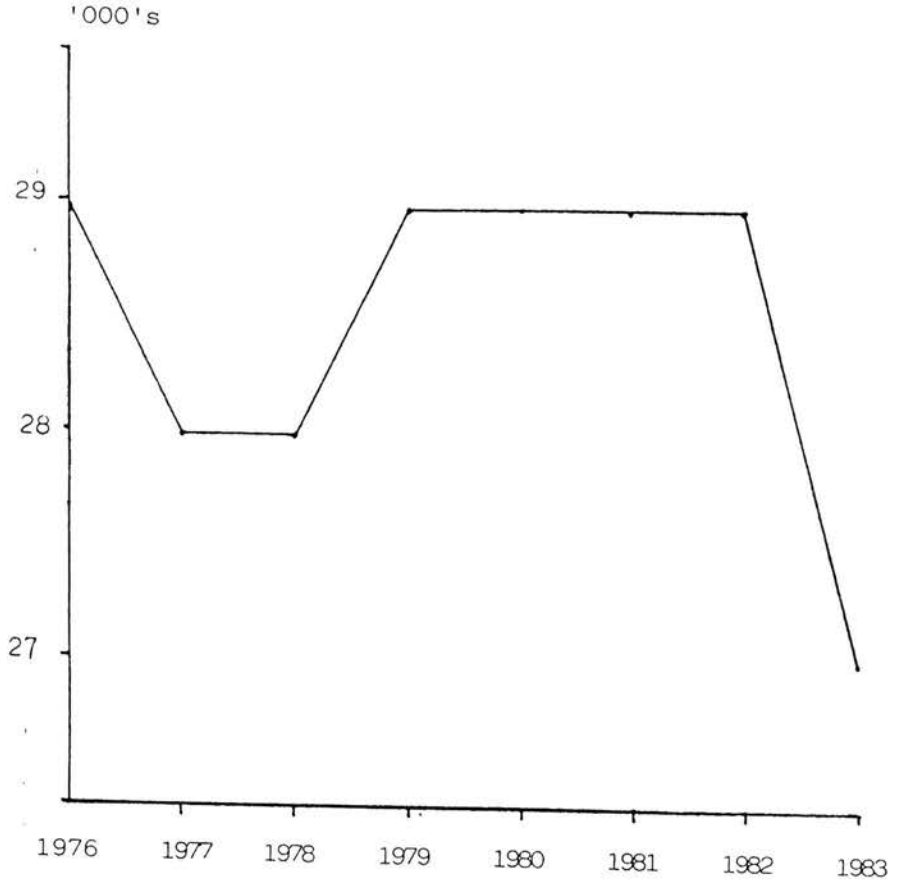


FIGURE 2.11: CONSTRUCTION



SOURCE: SAS OP CIT

FIGURE 2.12: GAS, ELECTRICITY AND WATER



SOURCE: SAS OP CIT

FIGURE 2.13: SERVICE INDUSTRIES

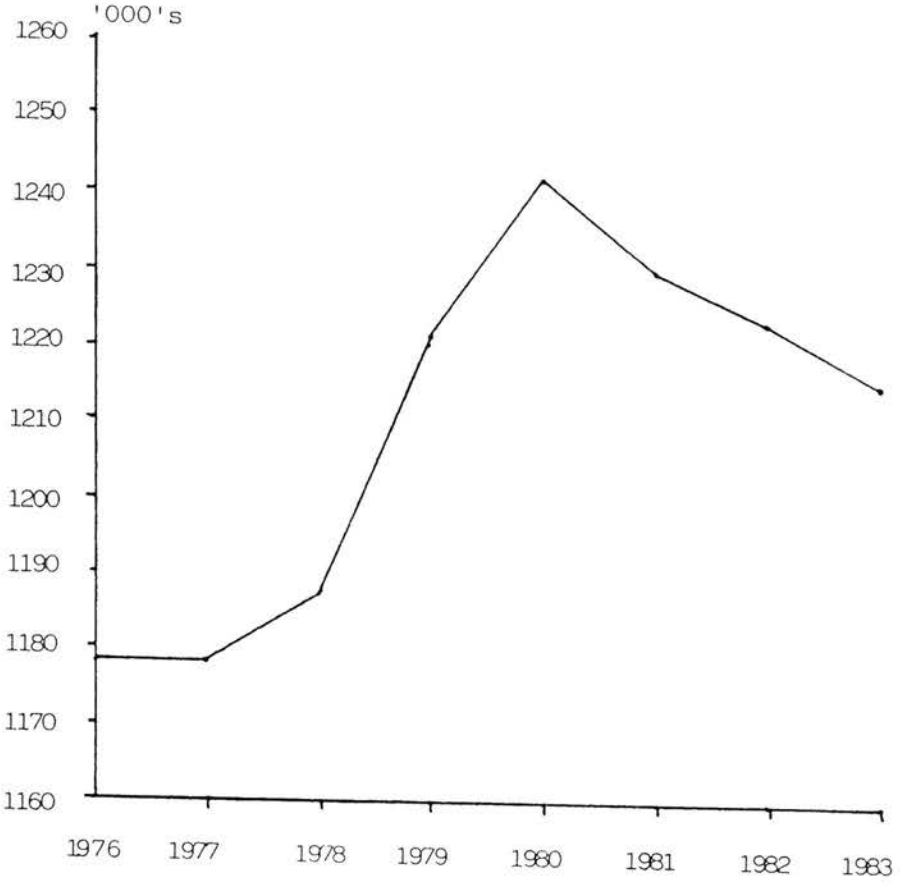
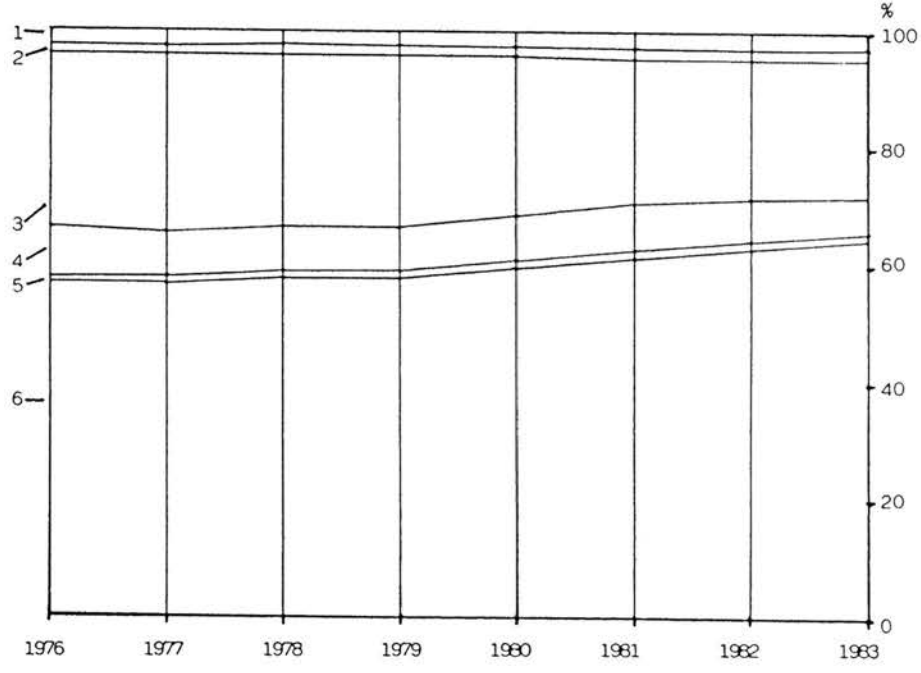


Table 2.4

The percentage of all ages' employment in six industry groups, 1976-83

Orders (1968 SIC)		1976	1977	1978	1979	1980	1981	1982	1983
I	Agriculture, Forestry and Fishing	2.4	2.4	2.3	2.3	2.2	2.3	2.3	2.3
II	Mining and Quarrying	1.7	1.7	1.9	2.0	2.1	2.2	2.3	2.3
III-XIX	Manufacturing Industries	29.4	29.7	29.2	28.5	26.7	25.0	24.0	22.9
XX	Construction	8.3	7.9	7.7	7.8	7.7	7.1	6.6	6.4
XXI	Gas, Electricity and Water	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.4
XXXII-XXVII	Service Industries	56.9	56.9	57.5	58.1	60.0	62.1	63.4	64.6
	All Industries	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

FIGURE 2.14: THE INDUSTRIAL COMPOSITION OF ALL AGES' EMPLOYMENT, SCOTLAND, 1976-83



KEY: (1) AGRICULTURE, FORESTRY AND FISHING.
(2) MINING AND QUARRYING.
(3) MANUFACTURING INDUSTRIES.
(4) CONSTRUCTION.
(5) GAS, ELECTRICITY AND WATER.
(6) SERVICE INDUSTRIES.

Table 2.5

The net changes in employment, job gains and job losses, all ages, Scotland, 1976-83 (thousands)

		1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1976-1983 (net)
I	Agriculture, Forestry and Fishing	0	- 1	0	- 3	0	- 1	- 1	- 6
II	Mining and Quarrying	+1	+ 3	+ 4	+ 1	- 1	+ 1	0	+ 9
III-XIX	Manufacturing Industries	+7	-11	- 6	-44	-59	-32	-32	-177
XX	Construction	-7	- 4	+ 3	- 4	-18	-13	- 7	- 50
XXI	Gas, Electricity and Water	-1	0	+ 1	0	0	0	- 2	- 2
XXII-XXVII	Service Industries	0	+ 9	+33	+22	-12	- 7	- 8	+ 37
	Job gains	8	12	41	23	0	1	0	85
	Job losses	8	16	6	51	80	53	50	264
	Net change	0	- 4	+35	-28	-80	-52	-50	-179

One thing worth noting is that employment in the service industries declined after 1980.

Male and Female All Ages Considered Separately

Table 2.6 shows all ages' total employment and employment in six broad industry groups, for each gender separately, over the period 1976-81. The figures are restricted to the years 1976, 1977, 1978 and 1981 by the lack of data disaggregated by gender for 1979, 1980 and 1983. This lack was due to a change in the timing of the Census of Employment which meant that no census was conducted in these years. Figure 2.15 shows all ages' total employment according to gender. Table 2.7 shows the percentage of total, male and female all ages employment in each of the six broad industry groups. Table 2.8 shows the gender composition of employment in each of the six industry groups.

The tables clearly show that whatever else happened, the gender composition of employment in the six broad industry groups remained remarkably constant between 1976 and 1981. The tables also make clear the fact that the service industries were the largest employers of both genders and became increasingly important over the period. It can also be seen from the tables that female all ages' industrial distribution of employment was more concentrated than that of males; with fully three quarters of female employees to be found in the service industries in 1981; as against less than half of male employees in the same year. In fact, the service industries category was the only one of the six groups in which females outnumbered males.

Tables 2.9 and 2.10 show the net changes in total employment, and job gains and losses for males and females, respectively. It can be seen from

Table 2.6

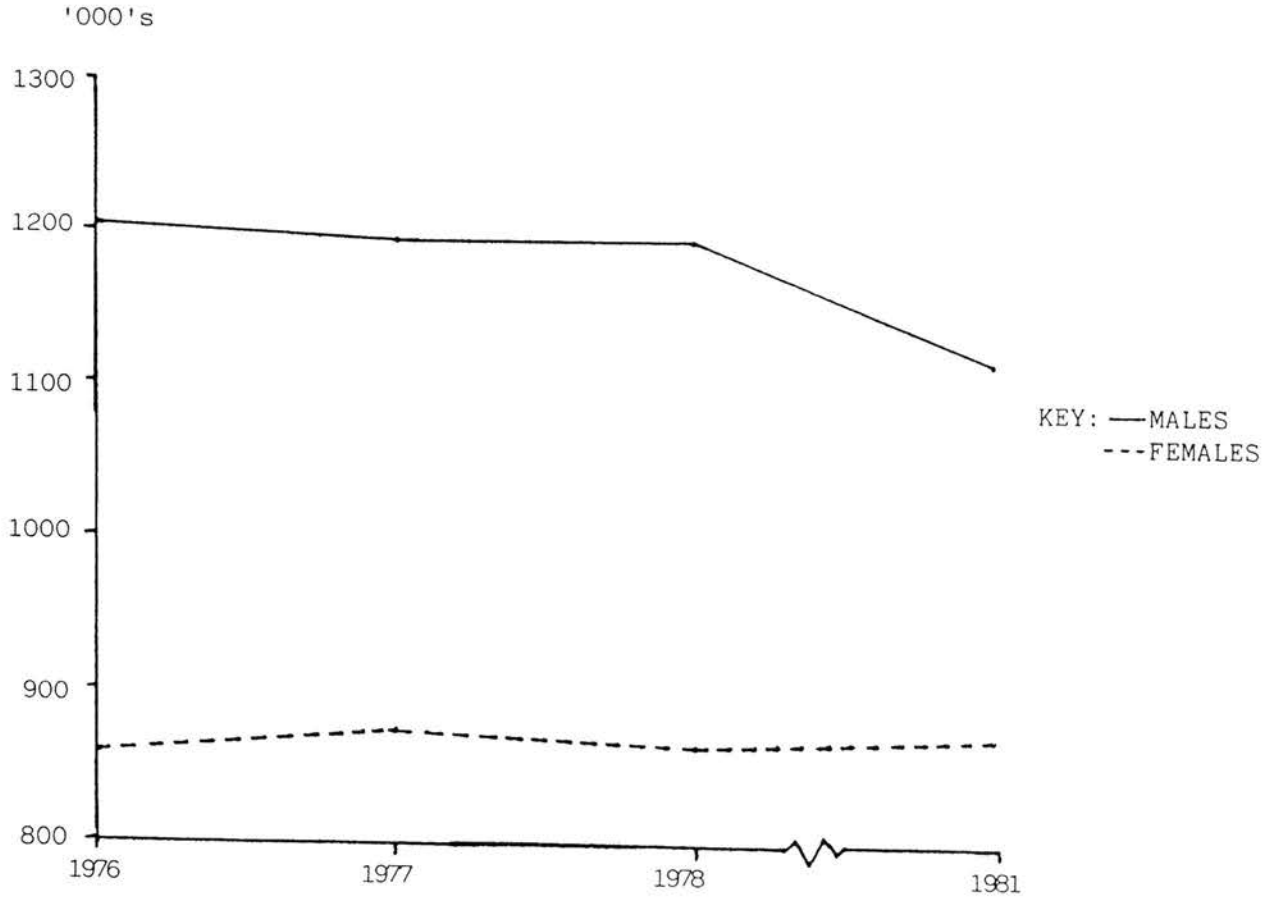
All ages employment in six industrial groups, males and females, Scotland, 1976-81

Orders (1968 SIC)		Males				Females			
		1976	1977	1978	1981	1976	1977	1978	1981
I	Agriculture, Forestry and Fishing	41	42	41	38	7	7	7	6
II	Mining and Quarrying	34	34	37	40	1	2	2	3
III-XIX	Manufacturing Industries	420	421	415	345	188	194	188	150.
XX	Construction	159	152	148	134	12	12	12	13
XXI	Gas, Electricity and Water	24	23	23	24	6	6	6	6
XXII-XXVII	Service Industries	532	527	535	536	647	653	652	695
Total		1210	1198	1200	1118	861	873	867	872

* The figures for 1981 are provisional. All figures relate to June. All figures in thousands.

Source: SAS op. cit., Table 9.3(b) pp58.

FIGURE 2.15: TOTAL EMPLOYMENT, BOTH SEXES, SCOTLAND, 1976, '77, '78 AND 1981



SOURCE: SAS OP CIT

Table 2.7

The percentage of all ages employment in six industry groups, males and females, Scotland 1976-81

Orders (1968 SIC)		Males				Females			
		1976	1977	1978	1981	1976	1977	1978	1981
I	Agriculture, Forestry and Fishing	3.4	3.5	3.4	3.4	0.8	0.8	0.8	0.7
II	Mining and Quarrying	2.8	2.8	3.1	3.6	0.1	0.2	0.2	0.3
III-XIX	Manufacturing Industries	34.7	35.1	34.6	30.9	21.8	22.2	21.7	17.2
XX	Construction	13.1	12.7	12.3	12.0	1.4	1.4	1.4	1.5
XXI	Gas, Electricity and Water	2.0	1.9	1.9	2.2	0.7	0.7	0.7	0.7
XXII-XXVII	Service Industries	44.0	43.9	44.6	48.0	75.1	74.8	75.2	79.7

Table 2.8

The sex composition of all ages employment in six industry groups, Scotland 1976-1981

Orders (1968 SIC)		1976		1977		1978		1981	
		M	F	M	F	M	F	M	F
I	Agriculture, Forestry and Fishing	85.4	14.6	85.7	14.3	85.4	14.6	86.4	18.6
II	Mining and Quarrying	91.2	8.8	94.4	5.6	94.9	5.1	93.0	7.0
III-XIX	Manufacturing Industries	69.1	30.9	68.5	31.5	68.8	31.2	69.7	30.3
XX	Construction	93.0	7.0	92.7	7.3	92.5	7.5	91.2	8.8
XXI	Gas, Electricity and Water	80.0	20.0	79.3	20.7	79.3	20.7	80.0	20.0
XXII-XXVII	Service Industries	45.1	54.9	44.7	55.3	45.1	54.9	43.5	56.5

Table 2.9

The net change in employment, job gains and job losses, males, all ages, Scotland, 1976-81

	Orders (1968 SIC)	1976-77	1977-78	1978-81	1976-81 (Net)
I	Agriculture, Forestry and Fishing	+1	-1	-3	-3
II	Mining and Quarrying	0	+3	+3	+6
III-XIX	Manufacturing Industries	+1	-6	-70	-75
XX	Construction	-7	-4	-14	-25
XXI	Gas, Electricity and Water	-1	0	+1	0
XXXII-XXVII	Service Industries	-5	+8	+1	+4
	Job Gains	2	11	5	18
	Job Losses	13	11	87	111
	Net Change	-11	0	-82	-93

Table 2.10

The net change in employment, job gains and job losses, females, all ages, Scotland, 1976-1981

	Orders (1968 SIC)	1976-77	1977-78	1978-81	1976-81 (Net)
I	Agriculture, Forestry and Fishing	0	0	-1	-1
II	Mining and Quarrying	+1	0	+1	+2
III-XIX	Manufacturing Industries	+6	-6	-38	-38
XX	Construction	0	0	+1	+1
XXI	Gas, Electricity and Water	0	0	0	0
XXII-XXVII	Service Industries	+6	-1	+43	+48
	Job Gains	13	0	45	58
	Job Losses	0	7	39	46
	Net Change	+13	-7	+6	+12

these tables that the net decline in all ages' total employment between 1976 and 1981 was largely a male phenomenon. Males accounted for 71.0 percent of the total job losses and only 23.7 percent of the job gains. The reason why males accounted for the bulk of the job losses is simply that they were numerically and proportionately more males than females in the main declining industry groups, i.e. manufacturing industries and construction. The reason why males accounted for such a small share of all ages' job gains is simply that they did not share in the part-time job gains experienced by females in the service industries. Whilst female employment in the service industries grew by 43,000 in the period 1978-81, male employment grew by only 1,000. Table 2.11 shows female all ages', full and part-time employment in the six industry groups in both 1977 and 1981, and the absolute change in employment between those two years. It can be seen from that table that the overall stability in female all ages' total employment between the two years was accounted for by the growth in part-time employment almost matching the decline in full-time employment and that the growth in part-time employment was predominantly a service industries phenomenon.

2.2.5. Summary and Implications for School Leavers

To summarise the contents of this section, it appears that since at least the middle of the nineteenth century there has been a decline in the relative importance of, and absolute employment in, agriculture. Until 1950, both the manufacturing and service industries increased both their relative importance, and their absolute employment. After 1950, the service industries continued to grow in relative importance mainly at the expense of the manufacturing industries. Moreover, employment in the service industries increased, and this growth was especially rapid after 1960. The fastest growing service industries since 1960 have been: financial services, medical services, educational services

Table 2.11

Female, all ages, full time and part time employment and employment change in six industry groups, Scotland 1977-1981

Orders (1969 SIC)		1977		1981		Change 1977-81	
		FT	PT	FT	PT	FT	PT
I	Agriculture, Forestry and Fishing	4142	2948	3537	2490	-605	-458
II	Mining and Quarrying	1539	345	2949	402	+1410	+57
III-XIX	Manufacturing Industries	163193	30221	27263	22388	-35930	-7833
XX	Construction	8130	3943	8904	4403	+774	+460
XXI	Gas, Electricity and Water	4669	1051	4481	1109	-188	+58
XXII-XVII	Service Industries	379431	273183	387337	307214	+7906	+34031
	TOTAL	561104	311691	534471	339115		
Job Gains						10090	34606
Job Losses						36753	8291
Net Change						-26633	+26315

Source: Unpublished table supplied by the Scottish Office. The figures relate to the Censuses of Employment of June 1977 and September 1981.

and, more recently, miscellaneous services, e.g. catering, leisure services. Employment in the manufacturing industries has declined since the late 1960's in Great Britain as a whole. This decline in manufacturing employment was especially rapid in the late 1970's and early 1980's. The manufacturing industries experiencing the largest absolute declines in employment have been the metal manufacturing, engineering and vehicles, and, textile and clothing industries. In Scotland, between 1976 and 1983, all ages' total employment declined. The largest parts of this decline were accounted for by the manufacturing and construction industries. The service industries saw an increase in all ages' employment until 1981 and a decline thereafter. There was a large scale increase in female all ages' part-time employment in the service industries until 1981, at least, which helped to offset female all ages' full-time job losses elsewhere. The exploitation of North Sea Oil produced some employment gains in the extractive industries.

The implications of this section for Scottish school leavers' industrial distribution of employment are fairly clear. One might expect to find evidence of the long term decline in the relative importance of agriculture. However, the major shift in school leavers' employment would be expected to be the one from manufacturing to services. In part, this would reflect the trend established since 1950, however, it would largely be expected to result from the dramatic decline in manufacturing employment that accompanied the recession that started in 1979.

2.3. Explanations of Industrial Change

The aim in this section is to briefly review three explanations of industrial change, namely, the "conventional view", the Gershuny-Miles "social innovation" thesis (Gershuny, 1983; Gershuny and Miles, 1983) and the de-industrialisation hypothesis. The purpose of the review is to answer the question of what has

caused all ages' employment to shift towards the service industries and away from the manufacturing industries in recent years.

The Conventional View

The "conventional view" of industrial change, as it is called by Gershuny and Miles (1983), has three elements: Engel curves, the increasing division of labour and the productivity gap. The Engel curve element relates to the effects of the difference between the income elasticities of demand for manufactured goods and services. It is contended that the demand for manufactured goods has been less income elastic than the demand for services and that increasing real incomes over time have caused the composition of final demand to shift towards services at the expense of manufactured goods. This change in the composition of final demand has then been reflected in a shift in employment.

The increasing division of labour element of the conventional view relates to the increasing division of labour within British manufacturing firms which has led, over time, to the increasing sub-contracting of management functions to specialist service industries. That is, over time, manufacturing industries have increasingly come to make use of specialist service industries, such as accountancy firms, recruitment agencies, management consultants, design studios, etc, to undertake functions that were previously undertaken in-house by the manufacturing industries themselves. Hence, the increasing division of labour within the manufacturing industries caused a *transfer* of employment from the manufacturing industries to the service industries.

The final element of the conventional view is the notion of a "productivity gap" between the manufacturing and service industries. The term "productivity gap" is used to describe the assertion that productivity growth in the service industries is much slower than in the manufacturing industries, mainly because

there is less scope for increasing the capital intensity of production.[9] Since the productivity of service industry workers is assumed to be lower than that of manufacturing industry workers, any given equal increase in demand would, therefore, bring about a larger increase in employment if it were devoted to the purchase of services than if it were devoted to the purchase of manufactured goods. Hence, as the demand for manufactured goods and services increased over time, employment in the service industries grew at a faster rate than employment in the manufacturing industries. This greater capacity of the service industries to generate jobs is enhanced by the fact that the service industries make greater use of part-time labour than other industries.

Social Innovation

In their account of the rise of "The New Service Economy" Gershuny (1983) and Gershuny and Miles (1983), add their own fourth element to the three elements of the conventional view; namely, the price elasticity of demand for services. They argue that low productivity growth in the service industries, combined with a wage determination process which causes service workers' real wages to increase in line with production industries' workers' real wages, caused real wage growth to outstrip productivity growth in the service industries. This then resulted in a rise, over time, in the relative price of final, marketed i.e. commercially sold, services.

The rise in the relative price of services is contended by Gershuny and Miles (1983) to have been the main spur to a process of "social innovation", in which households combine manufactured goods and unpaid household labour to produce their own final services. Instances of such social innovation include: when households switch to buying cars and driving themselves about rather than catching buses or trains, when households switch to buying sophisticated cooking aids and cooking meals at home rather than eating in restaurants,

when households switch to buying cleaning equipment rather than employing servants, etc. This process of social innovation, in response to the rising relative price of final marketed services, is held to have, to a certain extent, offset the combined effect of the high income elasticity of demand for services and rising income levels upon the demand for services and hence service industry employment.

Gershuny and Miles (1983) contend that the growth in service sector employment has two sources. Firstly, they argue that the negative effects of social innovation on the final demand for services was offset by the effects of increased sub-contracting of management functions by manufacturing industries, to leave marketed, i.e. commercially sold, services with a constant share of final demand. The slow rate of growth of labour productivity in the marketed service industries translated this constant share of a growing level of final demand into an increased share of total employment. Secondly, it is argued that the growth in service industry employment was further boosted by the growth in the demand for non-marketed services. Non-marketed services are services which are not commercially provided, and most of them, such as education, health and welfare, are provided by the State. The high income elasticity of demand for such services combined with the limited scope for social innovation resulted in a considerable increase in the demand for such services. The low rate of growth of labour productivity in the non-marketed service industries translated this growth in demand into a considerable expansion of employment. The net result of this set of processes was a shift in all ages' employment toward the service industries.

De-industrialisation

Another element of the conventional view, in Britain at least, is the "de-industrialisation" hypothesis. This term is not used to describe a single hypothesis but rather a collection of hypotheses which have many proponents and many forms. Furthermore, the term "de-industrialisation" has been defined in a number of different ways (see Singh, 1977; Thirlwall, 1982) and there is little agreement as to the causes of the decline in the fortunes of Britain's manufacturing industries.

The common element, in the various accounts of Britain's de-industrialisation, is that it is viewed as a pathological, prolonged and cumulative decline in the manufacturing industries' contribution to the national economy (Hughes, 1981). This decline in the contribution of the manufacturing industries to the British economy is contended to be pathological in that it is much larger than might have been expected given the conventional view. The particular severity of the decline in the contribution of the manufacturing industries to the British economy is claimed to be, in large part, due to a set of long-standing weaknesses that afflict British manufacturing industries. Proponents of the de-industrialisation hypothesis would therefore contend that the shift in all ages' employment towards the service industries and away from the manufacturing industries is in large part due to the decline in the fortunes of Britain's manufacturing industries.

The declining fortunes of Britain's manufacturing industries have been variously attributed to: the crowding out of manufacturing investment by increased State expenditure (Bacon and Eltis, 1978), a lack of adequately trained manpower (Prais, 1983) and the effects of a process of cumulative causation wherein slow demand growth leads, via Verdoorn's law, to slower productivity growth thence to lower product quality, lower competitiveness against

imported manufactured goods, and hence slow demand growth (Singh, 1977; Eatwell, 1982).

Conclusion

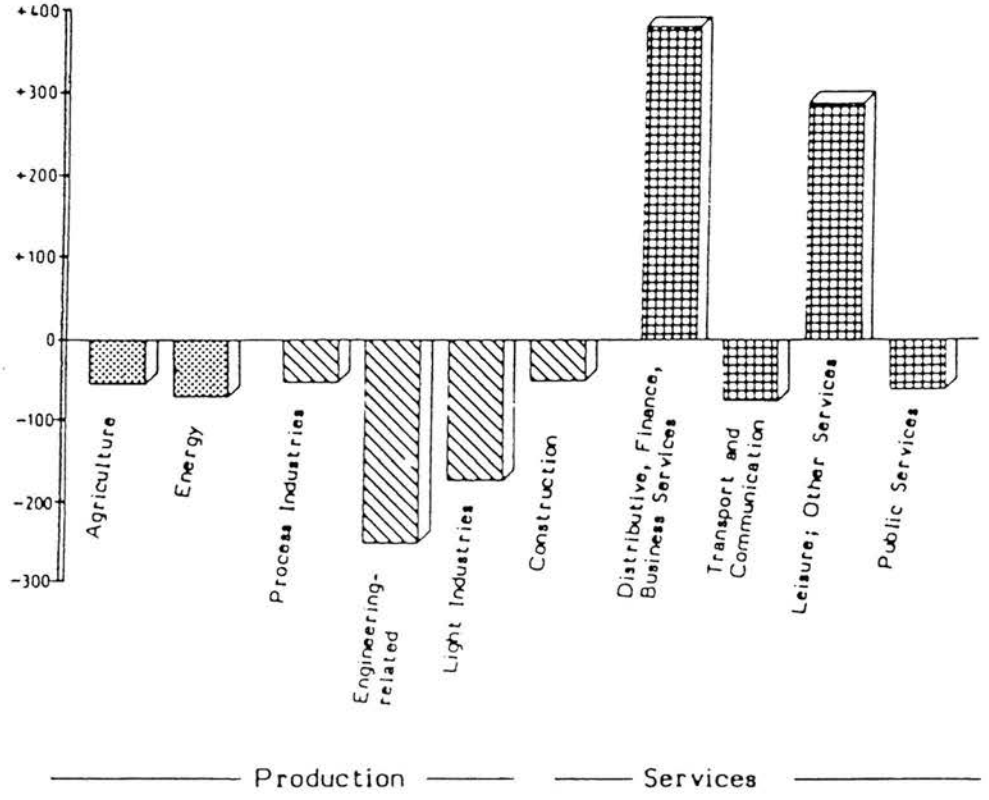
To conclude this section it may be said that there are no shortage of explanations for the shift in all ages' employment towards the service industries at the expense of the manufacturing industries; furthermore, this shift is forecast to continue. The final bar chart in Figure 2.5 shows The Institute for Employment Research's (1985) forecast of the changes in industrial employment until 1990.[10] Figure 2.16, taken from Rajan and Pearson (1986),[11] contains the mid-point forecasts of the change in employment in ten industries derived from their employer-based survey of occupational and employment trends in the UK to 1990. Both figures indicate a continued shift towards the service industries.

2.4. The Changes in the Industrial Distribution of Scottish School Leavers' Employment, 1977–83

2.4.1. Introduction

In this section, the changes in the industrial distribution of Scottish school leavers' employment between 1977 and 1983 are examined. Before the SEDA data relating to school leavers' industrial distribution of employment could be utilised, a number of changes had to be made in order to make the SEDA industrial classification system compatible with The 1968 and 1980 Standard Industrial Classifications. These changes are described in detail in Appendix 2.1.

Figure 2.16 Sectoral Change UK Workforce 1985-90



* These are mid point forecasts, the main report shows their variability.

Source: Rajan and Pearson (1986), Figure 2

2.4.2. The Data

This following analysis uses the information given by school leavers in response to the question "In what type of business do you work?".[12] The replies relate to the Spring of the year following their leaving school, i.e. approximately 10 months after the summer leavers left school and approximately 15 months after those who left at Christmas left school. The data used here are restricted to four regions in Scotland; namely, Fife, Lothian, Strathclyde and Tayside. This restriction resulted from a peculiarity of the 1977 data set. In 1977 non-certificated leavers were only included in the four regions listed above and Shetland. Since the other regions would not have included non-certificated leavers, and since the weighting factors were not available for Shetland, it was decided to limit the analysis to the replies given by the school leavers in four regions. For the sake of consistency, this restriction was also applied to the 1979, 1981 and 1983 data. The four included regions account for about three-quarters of the Scottish population. They differ from the excluded regions in that employment in Agriculture, Forestry and Fishing is less important and their unemployment rates were higher than the excluded regions. Thus, we can expect the data to under-estimate the importance of Agriculture, Forestry and Fishing as an employer of school leavers and to underestimate school leavers' employment in total.

The data used here are also restricted to those school leavers who attended state sector schools. The replies from those who attended private schools were excluded because the sampling arrangements for 1977 and 1979 were felt to be unsatisfactory. Since only a small fraction of all pupils in Scotland attend private schools, this restriction should not cause too many problems. Finally, the data used here have been weighted in order to take account of disproportionate stratification and known non-response, associated

with school leaver's gender and Scottish Certificate of Education attainment.

2.4.3. The Reconciliation of The 1968 and 1980 Standard Industrial Classifications

Before the main body of the work could be begun, one major preliminary problem had to be overcome: that of reconciling the 1968 and 1980 Standard Industrial Classifications (SICs). School leaver's industry of employment was coded, in the SEDA, according to the 1968 SIC in 1977 and 1979, and according to the 1980 SIC thereafter. As they were, the survey responses from the 1977, 1979 and later data sets were only comparable at a high level of aggregation (see Main and Raffe, 1983a).

The reconciliation of the 1968 and 1980 SIC's was tackled via the use of a simple reconciliation proposed in The Department of Employment's "Employment Gazette" of March 1983. This produced a 23-way classification linking the two SIC's. The way in which the Orders of the 1968 SIC and the Classes of the 1980 SIC are grouped into the new 23-way classification is shown in Appendix 2.2. The titles of the 23 industrial categories are shown in List One in Appendix 2.2. When convenient the 23 industrial categories hereafter referred to as "broad industry groups" were further aggregated to produce a six way classification. The six aggregated categories are: Agriculture, Forestry and Fishing; Mining and Quarrying; Manufacturing Industries; Construction; Gas, Electricity and Water, and, finally, Service Industries. The relationship between the six aggregated categories and the Orders of the 1968 SIC. and the Classes of the 1980 SIC. is shown in Appendix 2.3.

The Department of Employment's proposed reconciliation of the 1968 and 1980 SICs does not produce an exact correspondence between the 23 industrial

categories based upon groupings of the 27 Orders of the 1968 SIC, on the one hand, and the 23 industrial categories based upon groupings of the 60 Classes of the 1980 SIC, on the other hand. Appendix 2.4 examines the approximate effect of this imperfect correspondence upon school leavers' industrial distribution of employment. In the following sub-sections, dealing with both genders considered together and each gender considered separately, the industrial categories most affected by the imperfect correspondence between the 1968 SIC based categories and the 1980 SIC based categories are listed and the appropriate caveats applied to the results.

2.4.4. The Analysis for Both Genders Taken Together

Turning now to an examination of Scottish school leavers' industrial distribution of employment, Table 2.12 shows the percentage of each survey's sample of school leavers included in each of the six broad industry groups.

Before beginning the analysis proper it is necessary to consider the effects of industrial re-classification problems. The analysis contained in Appendix 2.4 suggests that the following industrial categories were most affected by the imperfect correspondence between the 1968 SIC based industrial categories, i.e. those for 1977 and 1979, and the 1980 SIC based categories, i.e. those for 1981 and 1983: Distributive Trades, Mechanical Engineering, and, Professional and Scientific Services. It is calculated in Appendix 2.4 that the first two had their percentages of school leavers' total employment increased by 2.2 percentage points and 1 percentage point respectively, and the latter had its share of school leavers' employment reduced by 1.4 percentage points as a result of the imperfect correspondence problem. The analysis also indicates that the relative sizes of the manufacturing and service sector's shares of school leavers' total employment were not affected by industrial re-classification. The calculations involved in deriving these results were based upon school leavers' 1979

Table 2.12

The percentages of school leavers' employment in six broad industry groups, both sexes, 1977, 1979, 1981, 1983

Industry group	1977	1979	1981	1983
Agriculture, Forestry and Fishing	2.1	1.9	2.5	3.1
Mining and Quarrying	1.3	1.2	1.2	0.6
Manufacturing Industries	38.9	33.5	26.5	29.0
Construction	7.2	8.1	9.7	9.7
Gas, Electricity and Water	0.8	1.0	1.1	1.1
Service Industries	49.7	54.3	59.0	56.5
All industries	100.0	100.0	100.0	100.0

Source: SEDA, 1977, 1979, 1981, 1983

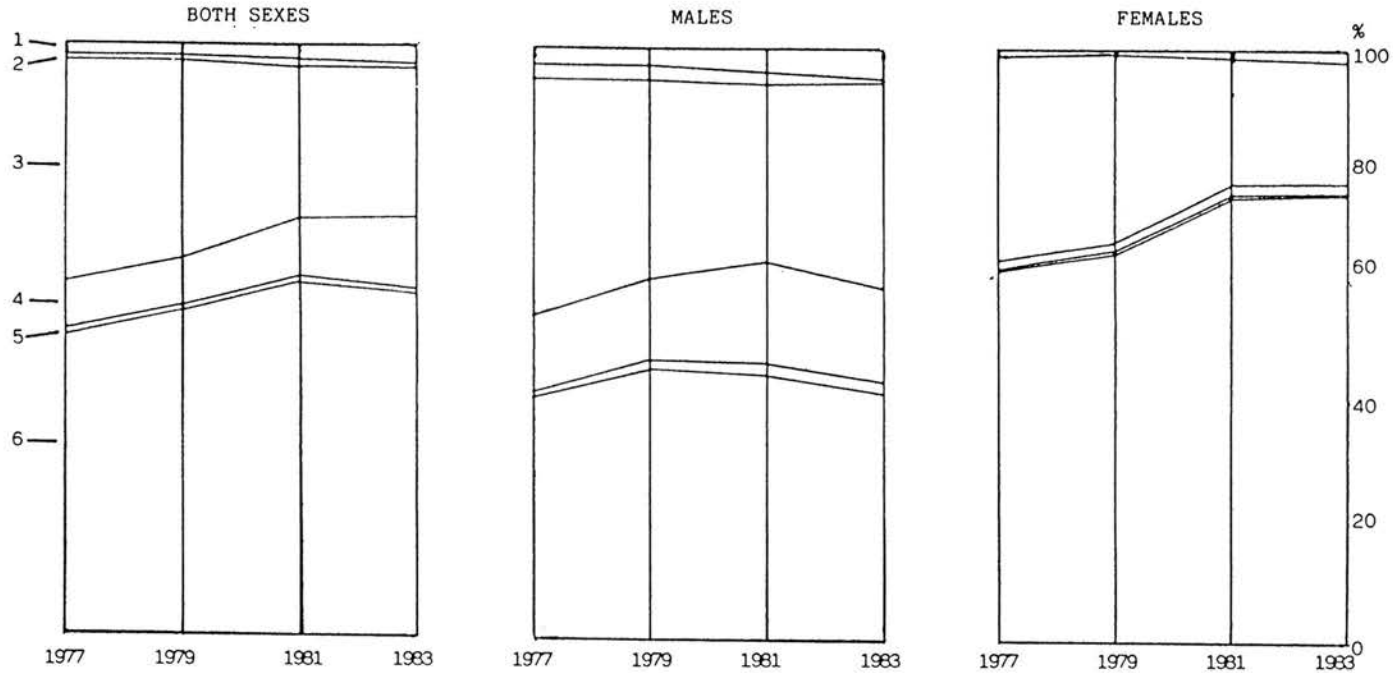
industrial distribution of employment. The details of the calculations are given in Appendix 2.4.

It can be seen from that table that in each of the survey years the service industries were the largest employers of school leavers. The manufacturing industries were the next largest employers of school leavers. The final industry of importance was the construction industry.

From Figure 2.17, which shows school leavers' industrial distributions of employment, and from Table 2.12, it is possible to see the main changes in the industrial distribution of school leavers' employment between 1977 and 1983. There were three main changes. The first was a growth in the percentage of school leavers' employment accounted for by the service industries. This overall growth consisted of an increase in the percentage of school leavers going into the service industries between 1977 and 1981 and a decrease after 1981. Over the period 1977–83, the service industries increased their relative share of school leavers' total employment by 6.8 percentage points, from 49.7 per cent in 1977 to 56.5 per cent in 1983. This compares with a 7.7 percentage point increase in the proportion of all ages' employment accounted for by the service industries between 1976 and 1983; see Table 2.4 above. The decline in the relative share of school leavers' employment accounted for by the service industries after 1981 is probably related to the decline in all ages' employment in those industries after 1980 and the concomitant reduction in the recruitment of school leavers.

The second change over the period was for the relative share of school leavers' employment accounted for by the manufacturing industries to decline. This entire period decline consisted of a marked decline in their relative share between 1977 and 1981, and a slight rise between 1981 and 1983. Over the

FIGURE 2.17: THE INDUSTRIAL COMPOSITION OF SCHOOL LEAVERS' EMPLOYMENT, 1977, '79, '81 AND '83



SOURCE: SEDA, 1977, 1979, 1981, 1983

KEY: (1) AGRICULTURE, FORESTRY AND FISHING. (2) MINING AND QUARRYING. (3) MANUFACTURING INDUSTRIES. (4) CONSTRUCTION. (5) GAS, ELECTRICITY AND WATER. (6) SERVICE INDUSTRIES.

period 1977-83, the manufacturing industries' share of school leavers' total employment fell by 9.9 percentage points, from 38.9 per cent in 1977 to 29 per cent in 1983. This compares with a 6.6 percentage point decline in the proportion of all ages' employment accounted for by the manufacturing industries between 1976 and 1983, see Table 2.4 above. The relative decline in the manufacturing industries' share of school leavers' total employment between 1977 and 1981, and slight rise thereafter, probably reflected the fact that all ages' employment in the manufacturing industry was declining before the onset of the decline in all ages' employment in the service industries.

The final trend was for the construction industry's share of school leavers' total employment to increase over the period 1977-83. This entire period increase consisted of an increase between 1977 and 1981 and a stable share thereafter. Over the period 1977-83, the construction industry increased its relative share of school leavers' total employment by 2.5 percentage points from 7.2 per cent to 9.7 per cent. The construction industry is anomalous in that its relative share of school leavers' total employment increased even though all ages' employment in the construction industry declined sharply after 1976.

Comparing Table 2.4 and Table 2.12 reveals that the principal differences between all ages' and school leavers' industrial distributions of employment in 1977 was school leavers' relative under-representation in the service industries and relative over-representation in the manufacturing industries. In 1983, school leavers were still noticeably under-represented in the service industries, however, their over-representation in the manufacturing industries was not as marked as it had been in 1977. This was due to the fact that between 1977 and 1983 school leavers had become relatively over-represented in the construction industry.

Turning to a more detailed analysis of the industrial distribution of school leavers' employment, Table 2.13 shows school leavers' employment in the 23 industrial categories discussed above and listed in List One in Appendix 2.1. From Table 2.13 it can be seen that the following industrial categories: Distributive Trades; Public Administration and Defence; Construction and, in 1977, Miscellaneous Services, and, Clothing, Footwear etc. were the biggest single employers of school leavers. Those industrial categories which accounted for a particularly small shares of school leavers' employment included: Bricks, Pottery etc; Gas, Electricity and Water; Chemicals and Allied Industries, Other Manufacturing Industries and, latterly, Metal Manufacturing.

From Table 2.13 it can be seen that, over the period 1977-83, certain industrial categories noticeably increased their share of school leavers' total employment. They included: Construction; Public Administration and Defence; Insurance, Banking, Finance, etc. and, latterly, Timber, Furniture etc., the latter of which mainly consists of sawmilling in Scotland (Coopers and Lybrand, 1986). Those industrial categories which experienced a noteworthy decline in their relative share of school leavers' total employment included: Metal Manufacturing; Shipbuilding and Marine Engineering and Vehicles; Textiles; Paper, Printing etc., and, Miscellaneous Services. The decline in Miscellaneous Services share of school leavers' total employment was partly an artefact of the imperfect reconciliation of the 1968 and 1980 SIC's (see Appendix 2.4 and sub-section 2.4.6 below).

So, over the period, 1977 to 1983, school leavers, in common with all ages, experienced a shift in their employment away from the manufacturing industries and towards the service industries. Even so, in both 1977 and 1983, school leavers were relatively, relative to all ages, under-represented in the service industries and over-represented in the manufacturing industries. The

Table 2.13

The industrial distribution of Scottish school leavers' employment, both sexes, with rank, 1977, 1979, 1981 and 1983

Industrial Category	% 1977	% 1979	% 1981	% 1983	Rank 1977	Rank 1979	Rank 1981	Rank 1983
1. Agriculture, Forestry and Fishing	2.1	1.9	2.5	3.1	14	15	13	12
2. Mining and Quarrying	1.3	1.2	1.2	0.6	17	17	15	20
3. Gas, Electricity and Water	0.8	1.0	1.1	1.1	22	18	18	16
4. Metal Manufacturing	1.6	1.0	0.4	0.5	16	18	22	21
5. Bricks, Pottery, Glass and Cement etc	0.5	0.6	0.4	0.1	23	23	22	23
6. Chemicals and Allied Industries	1.1	1.0	0.6	0.5	19	18	21	21
7. Mechanical Engineering	4.0	3.0	2.9	3.1	11	11	11	12
8. Electrical Engineering	5.0	5.3	4.1	7.0	10	7	8	7
9. Shipbuilding, Marine Engineering and Vehicles	5.0	4.0	2.9	2.4	9	10	11	14
10. Instrument Engineering and Metal Goods, NES	1.3	1.8	1.2	1.6	17	16	15	15
11. Food, Drink and Tobacco	5.2	5.3	5.3	3.4	8	7	7	11
12. Textiles	3.4	2.3	1.2	1.0	12	13	15	17
13. Clothing and Footwear, Leather, Leather Goods and Fur	7.7	5.2	4.1	4.0	3	9	8	8
14. Timber, Furniture, etc	1.1	1.0	0.8	3.6	19	18	19	9
15. Paper, Printing and Publishing	2.1	2.2	1.8	0.8	14	14	14	19
16. Other Manufacturing Industries	1.0	0.8	0.7	0.9	21	22	20	18
17. Construction	7.2	8.1	9.7	9.7	5	4	3	2
18. Distributive Trades	16.4	17.1	19.7	18.1	1	1	1	1
19. Miscellaneous Services	11.2	11.4	9.4	8.5	2	2	4	5
20. Transport and Communication	2.5	2.9	3.7	3.6	13	12	10	9
21. Insurance, Banking, Finance and Business Services	6.0	6.7	9.1	9.0	6	5	5	4
22. Public Administration and Defence	7.6	9.7	10.8	9.6	4	3	2	3
23. Professional and Scientific Services	6.0	6.5	6.3	7.7	6	6	6	6
Unweighted N's	4127	3956	7743	1663				

Source: SEDA, 1977, 1979, 1981, 1983

decline in the shares of school leavers' total employment accounted for by the metal-using and textile industries were particularly large, as might have been expected from the discussion in Section 2.3. Also, to be expected was the increase in the relative share of school leavers' total employment accounted for by Insurance, Banking, Finance etc. The shift towards the construction industry was specific to school leavers.

2.4.5. Females

Table 2.14 shows the percentage of female school leavers' employment in six broad industry groups in each of the survey years. From that table it can be seen that the service industries dominated all other industries as employers of female school leavers. The manufacturing industries were the only other important employers of female school leavers.

From Table 2.14 and the relevant part of Figure 2.17 two main trends in female school leavers' industrial distribution of employment, over the period 1977 to 1983, can be discerned. The first is the increasing dominance of the service industries. Over the period 1977-83 they increased their share of female school leavers' total employment by 13.2 percentage points from 61.8 per cent in 1977 to 75.0 per cent in 1983. The second main trend was a mirror image of the first: the decline in the relative share of female school leavers' total employment accounted for by the manufacturing industries. Over the period 1977-83, they saw their relative share fall by 13.8 percentage points, from 35.4 per cent in 1977 to 21.6 per cent in 1983. The increase in the relative share of female school leavers' total employment accounted for by the service industries and the decline in the relative share of female school leavers' total employment accounted for by the manufacturing industries took place between 1977 and 1981, with the biggest part occurring between 1979 and 1981. The industrial distribution of female school leavers' employment was

Table 2.14

The percentage of male and female school leavers' employment in six broad industry groups, 1977, 1979, 1981, 1983

	1977		1979		1981		1983	
Industry group	M	F	M	F	M	F	M	F
Agriculture, Forestry and Fishing	3.3	0.7	3.3	0.3	4.3	0.6	4.9	0.9
Mining and Quarrying	2.4	0.1	2.2	0.0	1.9	0.4	0.6	0.5
Manufacturing Industries	41.8	35.4	34.4	32.6	31.0	21.7	35.2	21.6
Construction	12.0	1.4	14.1	1.2	17.0	1.7	16.2	1.7
Gas, Electricity and Water	1.1	0.6	1.4	0.6	1.7	0.6	1.7	0.3
Service Industries	39.4	61.8	44.6	65.3	44.1	75.0	41.4	75.0
All industries	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: SEDA, 1977, 1979, 1981, 1983

relatively stable after 1981.

Table 2.15 shows the industrial distribution of female school leavers' employment amongst the 23 industrial categories. In Appendix 2.4 it is shown that, in the case of female school leavers, the most significant problems arising from the imperfect correspondence between the industrial categories based on the Orders of the 1968 SIC and those based on the Classes of the 1980 SIC were a boosting of the percentage of female school leavers' total employment accounted for by Insurance, Banking, Finance and Business Services, and, Clothing and Footwear etc., and a diminution of the percentage of female school leavers' total employment accounted for by Professional and Scientific Services.

It can be seen from Table 2.15 that the largest single employers of female school leavers were four service industries: Distributive Trades; Miscellaneous Services, Insurance, Banking, Finance etc. and Public Administration and Defence. Within the manufacturing industries, the biggest categories were: Clothing and Footwear etc; Food, Drink and Tobacco; and, latterly, Electrical Engineering. Industrial categories which accounted for a particularly small percentage of female school leavers' total employment included: Metal Manufacturing; Bricks, Pottery etc; Timber, Furniture etc. and, until 1981, Mining and Quarrying etc.

From Table 2.15 it can be calculated that the largest parts of the fourteen percentage point shift in female school leavers' employment away from the manufacturing industries were accounted for by: Clothing and Footwear etc (6 percentage points); Textiles (2.4 percentage points) and Food, Drink and Tobacco (2.4 percentage points). The largest parts of the 13 percentage point shift towards the service industries were accounted for by: Professional and

Table 2.15

The industrial distribution of female, Scottish school leavers' employment, with rank, 1977, 1979, 1981 and 1983

Industrial Category	% 1977	% 1979	% 1981	% 1983	Rank 1977	Rank 1979	Rank 1981	Rank 1983
1. Agriculture, Forestry and Fishing	0.7	0.3	0.6	0.9	17	20	14	12
2. Mining and Quarrying	0.1	0.0	0.4	0.5	23	23	19	17
3. Gas, Electricity and Water	0.6	0.6	0.6	0.3	19	16	14	21
4. Metal Manufacturing	0.4	0.3	0.1	0.3	20	20	23	21
5. Bricks, Pottery, Glass and Cement etc	0.3	0.1	0.2	0.1	21	22	21	23
6. Chemicals and Allied Industries	1.2	0.9	0.6	0.5	13	14	14	17
7. Mechanical Engineering	0.8	0.6	0.5	0.6	16	16	18	14
8. Electrical Engineering	3.5	4.3	2.6	4.0	9	8	8	7
9. Shipbuilding, Marine Engineering and Vehicles	0.7	0.4	0.4	0.6	17	18	19	14
10. Instrument Engineering and Metal Goods, NES	1.4	2.2	0.6	0.6	11	11	14	14
11. Food, Drink and Tobacco	5.1	6.2	4.0	2.7	7	7	7	8
12. Textiles	4.4	3.5	1.9	2.0	8	9	10	10
13. Clothing and Footwear, Leather, Leather Goods and Fur	14.0	9.8	8.1	8.2	2	5	6	5
14. Timber, Furniture, etc	0.3	0.4	0.2	0.9	21	18	21	12
15. Paper, Printing and Publishing	2.2	2.8	1.8	0.4	10	10	11	20
16. Other Manufacturing Industries	1.1	0.9	0.8	0.5	14	14	13	17
17. Construction	1.4	1.2	1.7	1.7	11	13	12	11
18. Distributive Trades	21.4	23.0	24.1	22.0	1	1	1	1
19. Miscellaneous Services	13.5	10.5	14.5	12.9	3	4	2	4
20. Transport and Communication	1.1	1.7	2.4	2.4	14	12	9	9
21. Insurance, Banking, Finance and Business Services	9.9	10.7	14.2	14.6	5	3	3	3
22. Public Administration and Defence	5.7	8.5	8.5	8.1	6	6	5	6
23. Professional and Scientific Services	10.2	10.9	11.3	15.0	4	2	4	2
Unweighted N's	1943	1980	3999	755				

Source: SEDA 1977, 1979, 1981, 1983

Table 2.16

The industrial distribution of male, Scottish school leavers' employment, with rank, 1977, 1979, 1981 and 1983

Industrial Category	% 1977	% 1979	% 1981	% 1983	Rank 1977	Rank 1979	Rank 1981	Rank 1983
1. Agriculture, Forestry and Fishing	3.3	3.3	4.3	4.9	10	10	11	7
2. Mining and Quarrying	2.4	2.2	1.9	0.6	16	13	12	19
3. Gas, Electricity and Water	1.1	1.4	1.7	1.7	20	17	15	14
4. Metal Manufacturing	2.6	1.6	0.7	0.7	12	15	18	18
5. Bricks, Pottery, Glass and Cement etc	0.7	1.0	0.5	0.1	23	21	19	23
6. Chemicals and Allied Industries	0.9	1.0	0.5	0.4	21	21	19	21
7. Mechanical Engineering	6.6	5.2	5.4	5.4	6	7	6	6
8. Electrical Engineering	6.2	6.0	5.6	9.5	7	6	5	4
9. Shipbuilding, Marine Engineering and Vehicles	8.5	7.4	5.2	3.9	5	5	7	12
10. Instrument Engineering and Metal Goods, NES	1.2	1.3	1.8	2.4	19	18	13	13
11. Food, Drink and Tobacco	5.3	4.6	6.5	4.0	8	8	4	11
12. Textiles	2.5	1.2	0.5	0.2	14	19	19	22
13. Clothing and Footwear, Leather, Leather Goods and Fur	2.6	1.1	0.5	0.5	12	20	19	20
14. Timber, Furniture, etc	1.8	1.6	1.4	5.8	18	15	17	5
15. Paper, Printing and Publishing	2.0	1.7	1.8	1.1	17	14	13	17
16. Other Manufacturing Industries	0.9	0.6	0.7	1.2	21	23	23	16
17. Construction	12.0	14.1	17.0	16.2	2	1	1	1
18. Distributive Trades	12.2	12.0	15.7	15.0	1	3	2	2
19. Miscellaneous Services	9.2	12.2	4.6	4.8	3	2	9	8
20. Transport and Communication	3.6	3.8	4.8	4.6	9	9	8	9
21. Insurance, Banking, Finance and Business Services	2.8	3.3	4.5	4.4	11	10	10	10
22. Public Administration and Defence	9.1	10.7	12.9	10.9	4	4	3	3
23. Professional and Scientific Services	2.5	2.6	1.6	1.7	14	12	16	14
Unweighted N's	2184	1976	3744	908				

Source: SEDA, 1977, 1979, 1981, 1983

Scientific Services (4.8 percentage points); Insurance, Banking, Finance and Business Services (4.7 percentage points) and Public Administration and Defence (2.4 percentage points). Of course, the shift away from Clothing and Footwear etc. will have been lessened by industrial re-classification problems, whilst the shift towards Insurance, Banking, Finance and Business Services will have been increased and the shift towards Professional and Scientific Services will have been diminished.

Table 2.17 shows the index of dis-similarity for both gender's industrial distributions of employment. The index of dis-similarity is defined as the mean absolute difference between the percentages allocated to the 23 industrial categories within any two industrial distributions of employment. The index can be used as a measure of the difference between two group's industrial distributions of employment at a point in time, or, as a measure of the change in a group of school leavers' industrial distribution of employment over time. Table 2.18 shows the correlation coefficients between each gender's industrial distribution of employment in each of the survey years. This measure can be used to trace the direction of the changes in a group of school leavers' industrial distribution of employment over time.

From Table 2.17 it can be seen that female school leavers' industrial distribution of employment changed between each of the survey years, with the largest changes occurring in the sub-periods 1977-79 and 1979-81. It should be appreciated that the scale of the changes will have been boosted in the period 1979-81 by industrial re-classification problems. From Table 2.18 it can be seen (looking at the final column) that the changes were unidirectional, with the female specific correlation coefficient decreasing with time.

Finally, Table 2.19 shows the Gini coefficients relating to female school

Table 2.17

The index of dissimilarity between each survey, males and females

	Index	
	Males	Females
1977-79	0.7	0.9
1979-81	1.3	0.9
1981-83	0.9	0.7
1977-83	1.9	1.4

Table 2.18

Correlation matrix of the industrial distributions of male and female school leavers' employment, 1977, 1979, 1981, 1983

Year		1977		1979		1981		1983	
	Sex	Male	Female	Male	Female	Male	Female	Male	Female
1977	Male	1.000	0.439	0.971	0.478	0.898	0.498	0.855	0.450
	Female		1.000	0.422	0.970	0.352	0.952	0.324	0.935
1979	Male			1.000	0.461	0.894	0.512	0.856	0.464
	Female				1.000	0.455	0.975	0.421	0.960
1981	Male					1.000	0.460	0.947	0.413
	Female						1.000	0.426	0.984
1983	Male							1.000	0.401
	Female								1.000

Table 2.19

Gini coefficients by sex, 1977, 1979, 1981, 1983

	1977	1979	1981	1983
Males	0.429	0.479	0.525	0.526
Females	0.617	0.615	0.657	0.654
Both sexes	0.448	0.473	0.524	0.508

leavers' industrial distributions of employment shown in Table 2.15. This measure is an adaptation of the measure used to gauge the equality of an income distribution and is used here as a measure of industrial concentration. The method by which the Gini coefficients were calculated is described in Appendix 2.5. The Gini coefficients in Table 2.19 indicate that female school leavers' industrial distribution of employment was highly concentrated in 1977 and became more so over the period 1977–83, particularly between 1979 and 1981, although this may be partly a reflection of industrial re-classification problems. This reflected the shift toward the service industries. The coefficient was stable between 1981 and 1983.

So, the service industries were *the* major employers of female school leavers in 1977 and by 1983 their predominance was even greater. The obverse of the increase in the relative importance of the service industries was the decline in the relative importance of the manufacturing industries.

2.4.6. Males

Table 2.14, shows the percentage of male school leavers' employment in the six broad industry groups. It can be seen from that table that for male school leavers both the service and manufacturing industries were important employers. The differential between the manufacturing and service industries' shares of male school leavers' total employment was much smaller than in the case of female school leavers, with each sector being of nearly equal relative importance for males. In contrast to female school leavers, the construction industry was an important employer of male school leavers.

From Table 2.14 and Figure 2.17 it can be seen that the changes in the industrial distribution of male school leavers' employment between 1977 and 1983 were not unidirectional. There appear to have been two phases. The first

phase covered the period 1977–81 and, in that phase, the manufacturing industries declined in relative importance and the service industries and the construction industry increased in relative importance. The second phase covered the period 1981–83 and, in that phase, the earlier trends were reversed, that is, the manufacturing industries increased in relative importance and the service industries and the construction industry decreased in relative importance.

From Table 2.14 it can be seen that the changes in male school leavers' industrial distribution of employment over the period 1977–83, as a whole, were much smaller than those experienced by female school leavers. Over the period, 1977–83 the manufacturing industries' relative share of male school leavers' total employment fell by only 6.6 percentage points (as against 13.8 percentage points for females), from 41.8 per cent in 1977 to 35.2 per cent in 1983. The service industries' share of their employment only increased by 2.0 percentage points (as against 13.2 percentage points for females), from 39.4 per cent in 1977 to 41.4 per cent in 1983. Finally, the construction industry saw its relative share of male school leavers' total employment increase by 4.2 percentage points, from 12.0 per cent in 1977 to 16.2 per cent in 1983.

Table 2.16 shows the industrial distribution of male school leavers' employment amongst the 23 industrial categories. In Appendix 2.4 it is shown that industrial re-classification problems were particularly important in boosting the percentage of male school leavers' total employment in Distributive Trades; Mechanical Engineering; and, Electrical Engineering; and, in diminishing the percentage of their total employment accounted for by Miscellaneous Services. The scale of the problems caused by industrial re-classification was greater for males than females.

It can be seen from Table 2.16 that the largest single industrial categories were: Construction; Distributive Trades (in common with female school leavers); Public Administration and Defence, and, in the early part of the period, Miscellaneous Services. Those industrial categories which accounted for a particularly small percentage of male school leavers' total employment included: Bricks, Pottery etc. (in common with female school leavers); Chemicals and Allied Industries, and, Other Manufacturing Industries.

From Table 2.16 it can be calculated that the small size of the shift toward the service industries was due to the fact that there was only a modest increase in the shares of male school leavers' total employment accounted for by service industrial categories such as Distributive Trades (up to 2.8 percentage points over the period); Public Administration and Defence (up to 1.8 percentage points) and Insurance, Banking, Finance and Business Services (up 1.6 percentage points) and a quite large decline in the share of male school leavers' total employment accounted for by Miscellaneous Services (down 4.4 percentage points). The apparent shift away from Miscellaneous Services towards Distributive Trades was almost certainly in the main part due to industrial re-classification problems and it may well be that the change in the distribution of male school leavers' employment amongst the service industries was quite modest in reality.

The small change in the manufacturing industries' share of male school leavers' total employment resulted from the fact that the large declines in the shares of Shipbuilding, Marine Engineering and Vehicles (down 4.6 percentage points over the period); Textiles (down 2.3 percentage points) and Clothing and Footwear etc (down 1.9 percentage points), were partially offset by increases in the shares of Timber, Furniture etc (up 4 percentage points) and Electrical Engineering (up 3.3 percentage points). The shift towards Electrical Engineering

was in part aided by industrial re-classification problems. It was the construction industry which benefited as a result of the decline in the relative importance of the manufacturing industries.

From Table 2.17, which contains the index of dis-similarity figures relating to male school leavers' industrial distribution of employment in each survey year, it can be seen that the period 1979-81 saw by far the largest changes in male school leavers' industrial distribution of employment, although this may in large part reflect industrial re-classification problems. From Table 2.18, which shows the correlation coefficients, it can be seen that this is reflected in the sharp rise in the male specific correlation coefficient between 1979 and 1981, (shown in the penultimate column), which indicates that the 1981 and 1983 male school leaver, industrial distributions of employment were more similar to one another than they were to the earlier male industrial distributions of employment, which is not surprising given the industrial re-classification problems.

Finally, from Table 2.19, which contains the Gini coefficients relating to male school leavers' industrial distributions of employment, in each survey year, it can be seen that male school leavers' industrial distribution of employment was less concentrated than that of females in each survey year, though the difference between the genders declined over the period. It can also be seen that, as in the case of female school leavers, male school leavers' industrial distribution of employment became more concentrated over the period 1977-83; this change consisted of two parts: a move towards increased concentration in the period 1977-81, particularly between 1979 and 1981, followed by stability between 1981 and 1983.

So, male school leavers, unlike female school leavers, and in contrast to

what the discussion in Section 2.3 might have led us to expect, did not experience a large relative shift in their employment toward the service industries. The main change in male school leavers' industrial distribution of employment was the shift away from the manufacturing industries towards the construction industry.

2.4.7. The Experiences of the Genders Compared, 1977 to 1983

Table 2.20 shows the gender composition of school leavers' employment in each of the 23 industrial categories in each of the survey years. From Table 2.20 it can be seen that the pattern was for males to outnumber females in all but the service industries and Textiles, and, Clothing and Footwear, and for females to outnumber males in most of the service industries. The apparent decline in male school leavers' share of both genders' combined employment in Miscellaneous Services between 1979 and 1981 owes a lot to industrial re-classification problems and may be purely an artefact of such problems.

The figures for the index of dis-similarity, between the gender's industrial distributions of employment in each survey year are contained in Table 2.21, and the correlation coefficients, are contained in Table 2.18. They both suggest that after 1979 the differences between male and female school leavers' industrial distributions of employment increased. This probably reflected the effects of the shift in female school leavers' employment toward the service industries and away from the manufacturing industries. That is, the increase in the difference between the male and female school leavers' industrial distributions of employment after 1979 resulted from an exacerbation of the pre-existing, i.e. existing prior to 1979, predominance of the service industries as employers of female school leavers. It may well, to a certain extent, also have reflected the differential impact between males and females of the re-classification problem.

Table 2.20

The sex composition of school leavers' employment in the 23 industrial categories, 1977, 1979, 1981, 1983

Industrial category	1977		1979		1981		1983	
	M	F	M	F	M	F	M	F
1	84.8	15.2	91.8	8.2	88.9	11.1	86.8	13.2
2	96.2	3.8	98.5	1.5	82.1	17.9	60.0	40.0
3	69.7	30.3	72.6	27.4	76.2	23.8	88.9	11.1
4	88.4	11.6	87.8	12.2	92.7	7.3	77.8	22.2
5	74.6	25.4	93.8	6.2	76.6	23.4	50.0	50.0
6	47.9	52.1	55.0	45.0	48.3	51.7	50.0	50.0
7	90.9	9.1	90.7	9.3	92.0	8.0	91.5	8.5
8	68.1	31.9	61.1	38.9	69.5	30.5	73.9	26.1
9	93.6	6.4	95.4	4.6	93.2	6.8	88.6	11.4
10	51.0	49.0	39.9	60.1	76.0	34.0	82.7	17.3
11	56.0	44.0	45.9	54.1	63.8	36.2	63.8	36.2
12	40.7	59.3	28.0	72.0	24.0	76.0	11.8	88.2
13	18.1	81.9	11.7	88.3	6.4	93.6	7.4	92.6
14	86.9	13.1	82.2	17.8	90.7	9.3	88.5	11.5
15	52.3	47.7	41.0	59.0	51.4	48.6	76.9	23.1
16	50.0	50.0	44.9	55.1	48.4	51.6	73.3	26.7
17	91.1	8.9	93.0	7.0	91.5	8.5	92.1	7.9
18	40.9	59.1	37.5	62.5	41.4	58.6	45.5	54.5
19	45.1	54.9	56.9	43.1	25.8	74.2	31.2	68.7
20	79.4	20.6	71.7	28.3	68.6	31.4	70.5	29.5
21	25.5	74.5	26.1	73.9	25.6	74.4	26.8	73.2
22	65.6	34.4	59.0	41.0	62.3	37.7	62.2	37.8
23	22.6	77.4	21.3	78.7	13.5	86.5	12.2	87.5
All indus. categories	54.7	45.3	53.4	46.6	52.1	47.9	55.0	45.0

Source: SEDA

Table 2.21

The index of dis-similarity between the sexes, 1977, 1979, 1981, 1983

	Index
1977	3.70
1979	3.62
1981	4.08
1983	4.20

2.4.8. Summary

The evidence presented in Section 2.2 suggested that a shift in school leavers' employment towards the service industries and away from the manufacturing industries was to be anticipated. School leavers' (both genders combined) employment did shift towards the service industries and away from the manufacturing industries between 1977 and 1983. However, school leavers' (both genders combined) employment also shifted towards the construction industry, unlike all ages'.

It was discovered that there was a sharp difference between the experiences of male and female school leavers. Female school leavers experienced a large shift towards the service industries at the expense of the manufacturing industries. Male school leavers, in contrast, only experienced a modest shift in their employment towards the service industries and it was the construction industry that benefited most from the decline in the relative importance of the manufacturing industries. For male school leavers changes in the relative importance of individual service and manufacturing industries were apparently quite large, but often offset one another, and they owed an unknown part to the re-classification problem.

Finally, the fact that both male and female school leavers experienced the largest changes in their industrial distribution of employment in the sub-period 1979 to 1981 suggests that the extraordinary difficulties faced by the manufacturing industries during this period played a large part in the changes in school leavers' industrial distributions of employment (though industrial re-classification problems also played a part in changing the relative importance of individual manufacturing and service industries) and that longer term influences, such as those discussed in Section 2.3, were of lesser importance.

2.5. The Industrial Pattern of School Leavers' Job Gains, Job Losses and Net Employment Change, 1977–83

2.5.1. Introduction

The changes in the industrial distribution of school leavers' employment examined in the previous section, were brought about by the increase or decrease in school leavers' absolute level of employment in individual industrial categories. The aim in this section is, therefore, to examine the industrial pattern of school leavers' job gains, job losses and net employment change over the period, 1977–83. This examination is first conducted for both genders taken together and then for females and males separately. Before the analysis could begin the sample estimates derived from the SEDA had to be grossed-up in order to provide population estimates. That was accomplished by use of the following equation:

(2.1) $E_{it} = C_{it} \cdot (E/L)_t \cdot SL_t \cdot P_t$

where:

E_{it} = The total number of school leavers estimated as being employed in industrial category i in year t.

C_{it} = The percentage of those employed school leavers recorded as being employed in industrial category i, in year t, in the SEDA

$(E/L)_t$ = The proportion of all school leavers recorded as being employed in year t in the SEDA

SL_t = The total number of school leavers in Scotland in year t

P_t = The proportion of all school leavers in employment recorded as being of either gender, in year t, in the SEDA

t = 1977, 1979, 1981, 1983

i = 1, 6, or, 1, 23

Equation (2.1) was applied to the sample estimates for both genders taken together (with $P_t = 1$) and to the sample estimates for each gender separately. The resulting figures were then rounded to the nearest whole number. The

number of school leavers in Scotland, in each of the survey years was, (approximately) 91,100, 93,200, 91,700 and 88,600 (Scottish Abstract of Statistics, 1984), respectively.

2.5.2. Both Genders

The results of applying equation (2.1) to the sample estimates for both genders taken together are shown in Table 2.22. It should be stressed at this point that since the "reconstructed" figures for school leavers' employment in each industrial category are based upon a number of sample estimates they cannot be taken to be exactly accurate and that, therefore, the following results are indicative rather than exact. Table 2.23 shows school leavers' job gains, job losses, net employment change and ratio of job gains to losses in each of the 23 industrial categories in the sub-periods 1977 to 1979, 1979 to 1981, 1981 to 1983, and over the entire period 1977 to 1983. Table 2.24 shows school leavers' job gains and losses in each of the six industry groups between 1977 and 1979, 1979 and 1981, 1981 and 1983, and, over the entire period 1977 to 1983.

At this point it is necessary to explain what is meant by terms such as "a job gain for school leavers", in the present context. Job gains are here defined as the increase in the number of jobs computed as being held by school leavers within an industrial category between time period t and time period t-1. Job losses are defined in an analogous manner. Finally, the net change in employment is simply calculated as the number of job gains minus the number of job losses. It should be pointed out at this point that the level of aggregation at which school leavers' industrial distribution of employment is examined will influence the number of job gains and job losses, as defined above. The lower the level of aggregation the greater the number of job gains and job losses. However, the net change, i.e. job gains minus job losses, will

Table 2.22

Reconstructed school leavers' industrial distributions of employment, both sexes, 1977, 1979, 1981, 1983

Industrial Category	1977	1979	1981	1983
1. Agriculture, Forestry and Fishing	1249	1167	1105	975
2. Mining and Quarrying	773	737	530	189
3. Gas, Electricity and Water	476	614	486	346
4. Metal Manufacturing	952	614	177	157
5. Bricks, Pottery, Glass and Cement etc	297	369	177	31
6. Chemicals and Allied Industries	654	614	265	157
7. Mechanical Engineering	2380	1843	1282	975
8. Electrical Engineering	2974	3255	1812	2202
9. Shipbuilding, Marine Engineering and Vehicles	2974	2457	1282	755
10. Instrument Engineering and Metal Goods, NES	773	1106	530	503
11. Food, Drink and Tobacco	3093	3255	2343	1069
12. Textiles	2023	1413	530	315
13. Clothing and Footwear, Leather, Leather Goods and Fur	4581	3194	1812	1258
14. Timber, Furniture, etc	654	614	354	1132
15. Paper, Printing and Publishing	1249	1351	796	252
16. Other Manufacturing Industries	595	491	309	283
17. Construction	4283	4975	4287	3051
18. Distributive Trades	9756	10503	8707	5693
19. Miscellaneous Services	6663	7002	4155	2674
20. Transport and Communication	1487	1781	1635	1132
21. Insurance, Banking, Finance and Business Services	3569	4115	4022	2831
22. Public Administration and Defence	4521	5958	4774	3019
23. Professional and Scientific Services	3569	3992	2785	2422
TOTAL	59488	61419	44155	31422

Table 2.23

School leavers' job gains, job losses and net employment change in 23 industrial categories, both sexes, 1977-83

Industrial category	1977-79	1979-81	1981-83	Job gains	Job losses	Net change	Ratio of gains to losses
1. Agriculture	- 82	- 62	- 130	0	274	- 274	0.00
2. Mining	- 36	- 207	- 342	0	585	- 585	0.00
3. Gas etc	+ 138	- 128	- 140	138	268	- 130	0.51
4. Metal Manuf	- 338	- 437	- 20	0	795	- 795	0.00
5. Bricks etc	+ 71	- 192	- 145	71	337	- 266	0.21
6. Chemicals	- 40	- 349	- 108	0	497	- 497	0.00
7. Mechanical Eng	- 537	- 561	- 307	0	1405	- 1405	0.00
8. Electrical Eng	+ 281	- 1443	+ 390	671	1443	- 772	0.47
9. Shipbuilding	- 518	- 1175	- 527	0	2220	- 2220	0.00
10. Instrument Eng	+ 332	- 575	- 27	332	602	- 270	0.55
11. Food etc	+ 162	- 913	- 1273	162	2186	- 2024	0.07
12. Textiles	- 610	- 882	- 216	0	1708	- 1708	0.00
13. Clothing etc	-1387	- 1382	- 554	0	3323	- 3323	0.00
14. Timber etc	- 40	- 261	+ 779	779	301	+ 478	2.59
15. Paper etc	+ 102	- 556	- 544	102	1100	- 998	0.09
16. Other Manuf	- 104	- 182	- 26	0	312	- 312	0.00
17. Construction	+ 692	- 688	- 1236	692	1924	- 1232	0.36
18. Dist Trades	+ 747	- 1795	- 3014	747	4809	- 4062	0.16
19. Misc Services	+ 339	- 2847	- 1481	339	4328	- 3989	0.08
20. Transport etc	+ 294	- 146	- 503	294	649	- 355	0.45
21. Insurance etc	+ 546	- 93	- 1191	546	1284	- 738	0.43
22. Public Admin	+1437	- 1184	- 1754	1437	2938	- 1501	0.49
23. Prof & Sci	+ 423	- 1208	- 363	423	1571	- 1148	0.27
Job gains	5564	0	1169	6733			
Job losses	3692	17266	13901		34859		
Net change	+1872	-17266	-12732			-28126	
Ratio of gains to losses	1.51	0.00	0.08				0.19
% of job gains 1977-83	82.6	0.00	17.4				
% of job losses 1977-83	10.6	49.5	39.9				
% of net change 1977-83	- 6.7	61.4	45.3				

not be affected.

It is also necessary to point out that even quite small changes in the percentage of school leavers' employment in individual industrial categories has a marked effect on their reconstructed employment figures. Consequently the industrial re-classification problem discussed above and in Appendix 2.4 will have had an effect on school leavers' job losses, job gains and net employment change between 1979 and 1981. The figures given for this sub-period should be treated with caution.

From Table 2.23 it can be seen that over the period 1977-83, as a whole, school leavers' job losses exceeded their job gains by 28,126 jobs. School leavers' total employment in 1983 was only 53 per cent of what it had been in 1977. This large, net, loss of jobs all took place after 1979. School leavers actually gained jobs, net, between 1977 and 1979. The sub-period which accounted for by far the largest number of school leavers' job losses was 1979-81. Given the differences in school leavers' experiences between sub-periods, it is worthwhile examining their experiences in each sub-period in more detail.

In the sub-period 1977-79 school leavers gained 1872 jobs, net. This increase in their employment was the result of their job gains outnumbering their job losses by 1.5 to one. In the sub-period 1979-81 school leavers gained no jobs at all and lost jobs heavily. They lost 17,266 jobs, net, in this sub-period. Finally, in the sub-period 1981-83 school leavers lost 12,732 jobs net and although they started to gain jobs again their job losses outnumbered their job gains by twelve to one. The overall story is, then, that school leavers' employment declined by nearly 50 per cent between 1977 and 1983 because, after 1979, their job losses outnumbered their job gains by nearly 27 to one.

Turning now to the industrial pattern of school leavers' job gains, job losses and net employment change in each sub-period, it can be seen from Table 2.23 that school leavers' net overall job gain between 1977 and 1979 resulted from job gains in: the service industries; Construction; Gas, Electricity and Water; and some manufacturing industries, more than offsetting job losses in: Agriculture, Forestry and Fishing; Mining and Quarrying etc. and some manufacturing industries. In the sub-period 1979-81 the steep decline in school leavers' employment was mainly accounted for by large job losses in both the manufacturing and service industries. Finally, the decline in school leavers' employment between 1981 and 1983 was mainly due to the large number of job losses in the service industries swamping the job gains in Electrical Engineering and Timber, Furniture etc. Overall then, the picture that emerges is of the manufacturing industries initiating school leavers' job losses, but the losses being initially offset by gains in the service industries. Then, as shown in Table 2.24, which shows school leavers' job gains and losses in each of the six broad industry groups, from 1979 to 1981 the service industries also began to become a major source of job losses and became the major source of school leavers' job losses after 1981.

Turning to a more detailed examination of the changes in school leavers' employment within individual industrial categories, it can be seen from an examination of Table 2.23 that, over the period 1977-83, all the industrial categories, but one, saw a net decline in school leavers' employment. The one industrial category which saw a net increase in school leavers' employment was Timber, Furniture etc. The industrial categories which accounted for the largest individual shares of school leavers' net job losses over the period 1977-83 were: Distributive Trades; Miscellaneous Services, and, Clothing and Footwear etc. Between them they accounted for 35.7 per cent of school

Table 2.24

School leavers' job gains and job losses in six industrial groups, both sexes, 1977–83

Industrial categories	1977–79		1979–81	
	JG's	JL's	JG's	JL's
Agriculture, Forestry and Fishing	0	82 (2.2)	0	62 (0.4)
Mining and Quarrying	0	36 (1.0)	0	207 (1.2)
Manufacturing Industries	948 (17.0)	3574 (96.8)	0	8908 (51.6)
Construction	692 (12.4)	0	0	688 (4.0)
Gas, Electricity and Water	138 (2.5)	0	0	128 (0.7)
Service Industries	3786 (68.0)	0	0	7273 (42.1)
All industries	5564 (100.0)	3692 (100.0)	0	17266 (100.0)

Industrial categories	1981–83		1977–83	
	JG's	JL's	JG's	JL's
Agriculture, Forestry and Fishing	0	130 (0.9)	0	274 (0.8)
Mining and Quarrying	0	342 (2.5)	0	585 (1.7)
Manufacturing Industries	1169 (100.0)	3747 (27.0)	2117 (31.4)	16229 (46.6)
Construction	0	1236 (8.9)	692 (10.3)	1924 (5.5)
Gas, Electricity and Water	0	140 (1.0)	138 (2.0)	268 (0.8)
Service Industries	0	8306 (59.8)	3786 (56.2)	15579 (44.7)
All industries	1169 (100.0)	13901 (100.0)	6733 (100.0)	34859 (100.0)

Key: JG's = job gains; JL's = job losses. Figures in parentheses are percentages of column total.

leavers' job losses and 40.5 per cent of their net decline in employment. Thus, school leavers' job losses and net change in employment were both highly concentrated. The relative role played by Distributive Trades was to some extent under-estimated due to the re-classification problem.

Finally, given the widespread nature of the net decline in school leavers' employment, it is of interest to discover if some industries reduced school leavers' employment by more or less than the economy-wide proportionate amount, i.e. 47 percentage points, between 1977 and 1983. If an individual industrial category had reduced school leavers' employment by the average, all industries' amount, then, its share of the net decline in school leavers' employment, over the period 1977-83, would have been equal to its share of school leavers' total employment in 1977. In other words, the ratio of an industrial category's share in the net decline in school leavers' employment to its share of school leavers' total employment in 1977 indicates the extent to which that industrial category reduced its school leaver employment by more or less than the average proportionate amount. For instance, if the ratio, for any industrial category, was 1.5, that would indicate that it had reduced its school-leaver employment by 50 per cent more than the average proportionate amount.

Table 2.25 shows the value of the ratio for the six broad industry groups. From that table it can be seen that: Agriculture, Forestry and Fishing; Construction, and, Gas, Electricity and Water, reduced their school-leaver employment by a noticeably less than average proportionate amount, that the service industries reduced their school-leaver employment by slightly less than the average proportionate amount, and, finally, that Mining and Quarrying etc. and the manufacturing industries reduced their school-leaver employment by larger than average proportionate amounts.

Table 2.25

Six industry groups' share of school leavers' employment in 1977, net change in employment 1977-1983 and the ratio of the two, both sexes

Industry Group	(1) % Share of Employment in 1977	(2) % Share of Net Change in Employment 1977-83	(3) (2)/(1)
Agriculture, Forestry and Fishing	2.1	1.0	0.5
Mining and Quarrying	1.3	2.1	1.6
Manufacturing Industries	38.9	50.2	1.3
Construction	7.2	4.4	0.6
Gas, Electricity and Water	0.8	0.5	0.6
Service Industries	49.7	41.9	0.8
All Industries	100.0	100.0	-

Table 2.26 shows the value of the ratio for the 23 industrial categories. The figures given in that table broadly confirm the story told by Table 2.25. The industrial categories which experienced the largest proportionate decreases in school leavers' employment were: Bricks, Pottery etc.; Metal Manufacturing; Textiles; Paper, Printing and Publishing; Mining and Quarrying etc.; Chemicals and Allied Industries; Shipbuilding, Marine Engineering and Vehicles; and Clothing and Footwear etc. All but one of these industrial categories, i.e. Mining and Quarrying etc, was a manufacturing industry. The industrial categories which experienced the smallest proportionate decreases in school leavers' employment were: Insurance, Banking, Finance and Business Services; Transport and Communication, and, Agriculture, Forestry and Fishing; the latter of which may have been protected from the decline in economic activity, after 1979, by the Common Agricultural Policy.

2.5.3. Females

Table 2.27 shows the results of applying equation (2.1) to the sample estimates for female school leavers' industrial distribution of employment. Table 2.28 shows female school leavers' job gains, job losses, net employment change and the ratio of job gains to losses in each of the 23 industrial categories and is analogous to Table 2.23. Table 2.29 shows female school leavers' job gains and losses over the same sub-periods in each of the six broad industry groups. From Table 2.28 it can be seen that over the period 1977-83 female school leavers lost 13,282 jobs net. In fact, their employment total in 1983 was only 51.9 per cent of what it had been in 1977, i.e. female school leavers' total employment halved over the six years from 1977 to 1983. From Table 2.28 it can be seen that all of this employment decline took place after 1979; with the decline in employment being almost equally divided between the two sub-periods 1979-81 and 1981-83.

Table 2.26

The percentage shares of the 23 industrial categories in school leavers' employment in 1977, net change in employment 1977–83, and the ratio of the two, both sexes

Industrial category	(1) % share in employment 1977	(2) % share in net change in employment 1977–83	(3) (2)/(1)
1. Agriculture	2.1	1.0	0.5
2. Mining	1.3	2.1	1.6
3. Gas etc	0.8	0.5	0.6
4. Metal Manuf	1.6	2.8	1.8
5. Bricks etc	0.5	1.0	2.0
6. Chemicals	1.1	1.8	1.6
7. Mechanical Eng	4.0	5.0	1.3
8. Electrical Eng	5.0	2.8	0.6
9. Shipbuilding	5.0	7.9	1.6
10. Instrument Eng	1.3	1.0	0.7
11. Food etc	5.2	7.2	1.4
12. Textiles	3.4	6.1	1.8
13. Clothing etc	7.7	11.8	1.5
14. Timber etc	1.1	-1.7	-
15. Paper etc	2.1	3.6	1.7
16. Other Manuf	1.0	1.1	1.1
17. Construction	7.2	4.4	0.6
18. Dist Trades	16.4	14.5	0.9
19. Misc Services	11.2	14.2	1.3
20. Transport etc	2.5	1.3	0.5
21. Insurance etc	6.0	2.6	0.4
22. Public Admin	7.6	5.4	0.7
23. Prof and Sci	6.0	4.1	0.7
All industries	100.0	100.0	-

Table 2.27

Reconstructed female school leavers industrial distributions of employment, 1977, 1979, 1981, 1983

Industrial Category	1977	1979	1981	1983
1. Agriculture, Forestry and Fishing	193	87	129	129
2. Mining and Quarrying	28	0	86	72
3. Gas, Electricity and Water	166	173	129	43
4. Metal Manufacturing	110	87	21	43
5. Bricks, Pottery, Glass and Cement etc	83	29	43	14
6. Chemicals and Allied Industries	331	260	129	72
7. Mechanical Engineering	221	173	107	86
8. Electrical Engineering	966	1242	558	574
9. Shipbuilding, Marine Engineering and Vehicles	193	116	86	86
10. Instrument Engineering and Metal Goods, NES	386	636	129	86
11. Food, Drink and Tobacco	1408	1791	858	388
12. Textiles	1215	1011	408	287
13. Clothing and Footwear, Leather, Leather Goods and Fur	3864	2831	1738	1177
14. Timber, Furniture, etc	83	116	43	129
15. Paper, Printing and Publishing	607	809	386	57
16. Other Manufacturing Industries	304	260	172	72
17. Construction	386	347	365	244
18. Distributive Trades	5907	6645	5171	3158
19. Miscellaneous Services	3726	3034	3111	1852
20. Transport and Communication	304	491	515	344
21. Insurance, Banking, Finance and Business Services	2733	3091	3047	2096
22. Public Administration and Defence	1573	2456	1824	1163
23. Professional and Scientific Services	2816	3149	2425	2153
TOTAL	27603	28837	21479	14324

Table 2.28

Female school leavers' job gains and net employment change in 23 industrial categories, 1977-83

Industrial category	1977-79	1979-81	1981-83	Job gains	Job losses	Net change	Ratio of gains to losses
1	- 107	+ 42	0	42	107	- 65	0.39
2	- 25	+ 83	- 14	83	39	+ 44	2.13
3	+ 7	- 45	- 86	7	131	- 124	0.05
4	- 24	- 65	+ 22	22	89	- 67	0.25
5	- 54	+ 14	- 29	14	83	- 69	0.17
6	- 71	- 131	- 57	0	259	- 259	0.00
7	- 47	- 66	- 21	0	134	- 134	0.00
8	+ 276	- 684	+ 16	293	684	- 391	0.43
9	- 78	- 30	0	0	118	- 118	0.00
10	+ 249	- 507	- 43	249	550	- 301	0.45
11	+ 384	- 933	- 471	384	1404	-1020	0.27
12	- 203	- 604	- 121	0	928	- 928	0.00
13	-1033	-1093	- 561	0	2687	-2687	0.00
14	+ 33	- 73	+ 86	119	73	+ 46	1.63
15	+ 202	- 423	- 329	202	752	- 550	0.27
16	- 44	- 88	- 100	0	232	- 232	0.00
17	- 40	+ 18	- 121	18	161	- 143	0.11
18	+ 738	-1474	-2014	738	3488	-2750	0.21
19	- 693	+ 78	-1260	78	1953	-1875	0.04
20	+ 188	+ 24	- 171	212	171	+ 41	1.24
21	+ 359	- 44	- 951	359	995	- 636	0.36
22	+ 882	- 632	- 661	882	1293	- 411	0.68
23	+ 334	- 724	- 272	334	996	- 662	0.34
Job gains	3652	259	124	4035			
Job losses	2419	7616	7282		17317		
Net change	+1233	-7357	-7158			-13282	
Ratio of gains to losses	1.51	0.03	0.02				0.23
% of job gains 1977-83	90.5	6.4	3.1				
% of job losses 1977-83	14.0	44.0	42.0				
% of net change 1977-83	- 9.3	55.4	53.9				

Table 2.29

Female school leavers' job gains and job losses in six industry groups, 1977-83

Industrial categories	1977-79 JG's	1977-79 JL's	1979-81 JG's	1979-81 JL's
Agriculture, Forestry and Fishing	0	107 (4.4)	42 (16.2)	0
Mining and Quarrying	0	25 (1.0)	83 (32.0)	0
Manufacturing Industries	1144 (31.3)	1554 (64.2)	14 (5.4)	4697 (61.7)
Construction	0	40 (1.7)	18 (6.9)	0
Gas, Electricity and Water	7 (0.2)	0	0	45 (0.6)
Service Industries	2501 (68.5)	693 (28.6)	102 (39.4)	2874 (37.7)
All industries	3652 (100.0)	2419 (100.0)	259 (100.0)	7616 (100.0)

Industrial categories	1981-83 JG's	1981-83 JL's	1977-83 JG's	1977-83 JL's
Agriculture, Forestry and Fishing	0	0	42 (1.6)	107 (0.6)
Mining and Quarrying	0	14 (0.2)	83 (2.1)	39 (0.2)
Manufacturing Industries	124 (100.0)	1732 (23.8)	1282 (31.8)	7983 (46.1)
Construction	0	121 (1.7)	18 (0.4)	161 (0.9)
Gas, Electricity and Water	0	86 (1.2)	7 (0.2)	131 (0.8)
Service Industries	0	5329 (73.2)	2603 (64.5)	8896 (51.4)
All industries	124 (100.0)	7282 (100.0)	4035 (100.0)	17317 (100.0)

Key: JG's = job gains; JL's = job losses. Figures in parentheses are percentages of column total.

Turning to the sub-period by sub-period analysis, in the sub-period 1977-79 female school leavers gained 1233 jobs net. This increase in their total employment was the result of job gains outnumbering job losses by 1.5 to one. In the sub-period 1979-81 female school leavers gained very few jobs and lost 7357 jobs net and their job losses outnumbered their job gains by over 29 to one. Finally in the sub-period 1981-83 female school leavers gained fewer jobs and lost fewer jobs than in the sub-period 1979-81, and in this sub-period lost 7158 jobs net. Between 1981 and 1983 female school leavers' job losses outnumbered their job gains by 59 to one. The overall story is, then, that female school leavers' employment declined by nearly 50 per cent between 1977 and 1983, because, after 1979, their job losses outnumbered their job gains by nearly 39 to one. Furthermore, female school leavers' total job gains fell between each sub-period.

Turning now to the industrial pattern of female school leavers' job losses it can be seen from Table 2.28 that female school leavers' overall net employment increase between 1977 and 1979 resulted from job gains in: Gas, Electricity and Water; Electrical Engineering; Instrument Engineering and Metal Goods N.E.S.; Food, Drink and Tobacco; Timber, Furniture etc.; Paper, Printing and Publishing, and, all the service industries, apart from Miscellaneous Services, more than offsetting job losses in the remaining industrial categories. In the sub-period 1979-81, female school leavers gained a small number of jobs in: Agriculture, Forestry and Fishing; Mining and Quarrying etc.; Bricks, Pottery etc.; Construction, Distributive Trades (which partly reflected an industrial re-classification effect), and, Miscellaneous Services; and, they lost jobs in all the remaining industrial categories. Finally, during the sub-period 1981-83, female school leavers gained just a few jobs in: Metal Manufacturing, Electrical Engineering, and, Timber, Furniture etc., and, lost jobs in the

remaining industrial categories. From Table 2.28, it can be seen that over the period 1977–83, as a whole, female school leavers gained jobs in only three industrial categories: Mining and Quarrying etc.; Timber, Furniture etc., and, Transport and Communication.

From Table 2.29 it can be seen that that the manufacturing industries initiated the net decline in female school leavers' employment and accounted for the largest number of job losses until 1981. After 1979, the service industries also began to account for a large number of female school leavers' job losses, and between 1981 and 1983 the service industries accounted for the largest part of female school leavers' job losses.

From Table 2.28 it can be seen that the industrial categories which accounted for the largest individual shares of female school leavers' job losses, over the period 1977–83 were: Distributive Trades; Clothing and Footwear etc.; and Miscellaneous Services. These three industrial categories between them accounted for 46.9 per cent of female school leavers' job losses and 55 per cent of their net decline in employment over the period 1977–83. Thus, female school leavers' job losses were highly concentrated, and would have been even more highly concentrated if it had not been for an industrial re-classification effect boosting female school leavers' employment in Clothing, Footwear etc. after 1979.

Table 2.30 shows the share of the six broad industry groups in female school leavers' total employment in 1977, their share of female school leavers' net employment decline over the period 1977–83, and, finally, the ratio of the two. As noted above, the value of this ratio indicates whether industrial groups reduced female school leavers' employment by more or less than the average proportionate amount. It can be seen from Table 2.30 that it was the

Table 2.30

Six industry groups share of female school leavers' employment in 1977, net change in employment 1977-1983 and the ratio of the two

Industry Group	(1) % Share of Employment in 1977	(2) % Share of Net Change in Employment 1977-83	(3) (2)/(1)
Agriculture, Forestry and Fishing	0.7	0.5	0.7
Mining and Quarrying	0.1	-0.3	-
Manufacturing Industries	35.4	50.5	1.4
Construction	1.4	1.1	0.8
Gas, Electricity and Water	0.6	0.9	1.5
Service Industries	61.8	47.4	0.8
All Industries	100.0	100.0	-

manufacturing industries and Gas, Electricity and Water which reduced female school leavers' employment by the greatest proportionate amount. The remaining industry groups reduced female school leavers' employment by less than the average proportionate amount.

Table 2.31 shows the same information for each of the 23 industrial categories and the figures in this table broadly confirm the pattern described above. The industrial categories which reduced female school leavers' employment by the greatest proportionate amounts over the period 1977–83 were: Paper, Printing and Publishing; Bricks, Pottery etc.; Chemicals and Allied Industries; Instrument Engineering and Metal Goods NES.; Textiles; and Other Manufacturing Industries. These are all manufacturing industries. The smallest proportionate reductions took place in: Insurance, Banking, Finance and Business Services; Public Administration and Defence; Professional and Scientific Services, and, Agriculture, Forestry and Fishing, i.e. service industries and an industry partially protected by the Common Agricultural Policy (see above). In the case of Insurance, Banking, Finance and Business Services the small proportionate decline in female school leavers' employment was in part due to industrial re-classification problems.

2.5.4. Males

Table 2.32 shows the results of applying equation (2.1) to the sample estimates relating to male school leavers' industrial distribution of employment. Table 2.33 shows male school leavers' job gains, job losses, net employment change and the ratio of gains to losses in each of the 23 industrial categories and for all the industrial categories taken together, for the whole period 1977–83 and between each survey. From Table 2.33, it can be seen that, over the period 1977–83, male school leavers lost 14,878 jobs, net. The whole of this net employment decline took place after 1979. In 1983, male school

Table 2.31

The percentage share of the 23 industrial categories in female school leavers' employment in 1977, net changes in employment 1977-83, and the ratio of the two

Industrial category	(1) % share in employment 1977	(2) % share in net change in employment 1977-83	(3) (2)/(1)
1. Agriculture	0.7	0.5	0.7
2. Mining	0.1	- 0.3	-
3. Gas etc	0.6	0.9	1.5
4. Metal Manuf	0.4	0.5	1.3
5. Bricks etc	0.3	0.5	1.7
6. Chemicals	1.2	2.0	1.6
7. Mechanical Eng	0.8	1.0	1.3
8. Electrical Eng	3.5	3.0	0.8
9. Shipbuilding	0.7	0.8	1.2
10. Instrument Eng	1.4	2.3	1.6
11. Food etc	5.1	7.7	1.5
12. Textiles	4.4	7.0	1.6
13. Clothing etc	14.0	20.2	1.4
14. Timber etc	0.3	- 0.3	-
15. Paper etc	2.2	4.1	1.9
16. Other Manuf	1.1	1.7	1.6
17. Construction	1.4	1.1	0.8
18. Dist Trades	21.4	20.7	1.0
19. Misc Services	13.5	14.1	1.0
20. Transport etc	1.1	- 0.3	-
21. Insurance etc	9.9	4.8	0.5
22. Public Admin	5.7	3.1	0.5
23. Prof and Sci	10.2	5.0	0.5
All industries	100.0	100.0	-

Table 2.32

Reconstructed male school leavers' industrial distributions of employment, 1977, 1979, 1981, 1983

Industrial Category	1977	1979	1981	1983
1. Agriculture, Forestry and Fishing	1055	1073	978	838
2. Mining and Quarrying	767	716	432	103
3. Gas, Electricity and Water	352	455	387	291
4. Metal Manufacturing	831	520	159	120
5. Bricks, Pottery, Glass and Cement etc	224	325	114	17
6. Chemicals and Allied Industries	288	325	114	68
7. Mechanical Engineering	2110	1691	1228	923
8. Electrical Engineering	1983	1952	1274	1624
9. Shipbuilding, Marine Engineering and Vehicles	2718	2407	1183	667
10. Instrument Engineering and Metal Goods, NES	384	423	409	410
11. Food, Drink and Tobacco	1695	1496	1478	684
12. Textiles	799	390	114	34
13. Clothing and Footwear, Leather, Leather Goods and Fur	831	358	114	85
14. Timber, Furniture, etc	576	520	318	992
15. Paper, Printing and Publishing	640	553	409	188
16. Other Manufacturing Industries	288	195	159	205
17. Construction	3837	4586	3866	2770
18. Distributive Trades	3901	3903	3570	2565
19. Miscellaneous Services	2942	3968	1046	821
20. Transport and Communication	115	1236	1092	787
21. Insurance, Banking, Finance and Business Services	895	1073	1023	752
22. Public Administration and Defence	2910	3480	2934	1864
23. Professional and Scientific Services	799	846	364	291
TOTAL	31976	32494	22764	17100

Table 2.35

Male school leavers' job gains, job losses and net employment change in 23 industrial categories, 1977-83

Industrial category	1977-79	1979-81	1981-83	Job gains	Job losses	Net change	Ratio of gains to losses
1. Agriculture	+ 18	- 95	- 140	18	235	- 217	0.08
2. Mining	- 52	- 283	- 329	0	664	- 664	0.00
3. Gas etc	+ 104	- 69	- 96	104	165	- 61	0.63
4. Metal Manuf	- 311	- 361	- 39	0	711	- 711	0.00
5. Bricks etc	+ 101	- 212	- 97	101	309	- 208	0.33
6. Chemicals	+ 37	- 212	- 45	37	257	- 220	0.14
7. Mechanical Eng	- 419	- 463	- 305	0	1187	- 1187	0.00
8. Electrical Eng	- 31	- 678	+ 351	351	709	- 358	0.50
9. Shipbuilding	- 311	-1224	- 516	0	2051	- 2051	0.00
10. Instrument Eng	+ 39	- 13	+ 1	40	13	+ 27	3.08
11. Food etc	- 199	- 18	- 794	0	1011	- 1011	0.00
12. Textiles	- 409	- 277	- 80	0	766	- 766	0.00
13. Clothing etc	- 474	- 244	- 28	0	746	- 746	0.00
14. Timber etc	- 55	- 202	+ 678	673	257	+ 416	2.62
15. Paper etc	- 87	- 144	- 221	0	452	- 452	0.00
16. Other Manuf	- 93	- 36	+ 46	46	129	- 83	0.36
17. Construction	+ 749	- 720	-1096	749	1816	- 1067	0.41
18. Dist Trades	+ 2	- 333	-1005	2	1338	- 1336	0.00
19. Misc Services	+1026	-2922	- 225	1026	3147	- 2121	0.33
20. Transport etc	+ 85	- 144	- 305	85	449	- 364	0.19
21. Insurance etc	+ 178	- 50	- 271	178	321	- 143	0.55
22. Public Admin	+ 571	- 547	-1070	571	1617	- 1046	0.35
23. Prof & Sci	+ 46	- 482	- 73	46	555	- 509	0.08
Job gains	2955	0	1071	4027			
Job losses	2441	9729	6735		18905		
Net change	+ 515	-9729	-5644			-14878	
Ratio of gains to losses	1.21	0.00	0.16				0.21
% of job gains 1977-83	73.4	0.00	26.6				
% of job losses 1977-83	12.9	51.5	35.6				
% of net change 1977-83	- 3.5	65.4	38.1				

leavers' employment total was only 53.5 per cent of what it had been in 1977. That is, over the period 1977–83, male school leavers' total employment fell in much the same proportion as female school leavers' total employment.

Turning to a sub-period by sub-period analysis, in the sub-period 1977–79, male school leavers gained 515 jobs, net, i.e. a much smaller number than female school leavers. During this sub-period, male school leavers' job gains outnumbered their job losses by 1.2 to one. In the sub-period 1979–81, male school leavers gained no jobs and lost 9792 jobs. In the sub-period 1981–83 male school leavers began to gain jobs again and lost fewer jobs than in the sub-period 1979–81; they lost 5644 jobs net; and their job losses outnumbered their job gains by approximately 6.3 to one.

The overall story for male school leavers is then much the same as for female school leavers, i.e. net job gains between 1977 and 1979, and net job losses thereafter. The main difference was that male school leavers fared worse than female school leavers between 1977 and 1981 and better than female school leavers between 1981 and 1983. This difference in experience probably resulted from the difference in timing between the onset of the decline in all ages' employment in the manufacturing and service industries.

Turning now to the industrial composition of male school leavers' job gains, job losses and net employment change, it can be seen from Table 2.33 that the net increase in male school leavers' employment between 1977 and 1979 was due to their job gains in: Agriculture, Forestry and Fishing; Gas, Electricity and Water; Bricks, Pottery etc.; Chemicals and Allied Industries; Instrument Engineering and Metal Goods N.E.S.; Construction and all the service industries, more than offsetting their job losses in all the remaining industrial categories. Between 1981 and 1983 males gained jobs in Timber, Furniture etc, Electrical

Engineering, and, Other Manufacturing Industries.

It can be seen from Table 2.34, which shows male school leavers' job gains and job losses in six broad industry groups over the period 1977-83, that, between 1977 and 1979, the manufacturing industries were the largest source of male school leavers' job losses and that the service industries were the largest source of male school leavers' job gains, followed by the construction industry. In the sub-period 1979-81, the service industries accounted for the largest proportion of male school leavers' job losses, closely followed by the manufacturing industries and then the construction industry. In the sub-period 1981-83, the service industries again accounted for the largest proportion of male school leavers' job losses, followed by the manufacturing industries and then the construction industry. As with female school leavers, the story is of job losses being initiated by the manufacturing industries between 1977 and 1979. After 1979, the service industries became the major source of job losses.

Turning back to Table 2.33, it can be seen that over the period 1979-83 as a whole, male school leavers gained jobs in only two industrial categories: Instrument Engineering; and Timber, Furniture etc. The industrial category which accounted for by far the largest number of male school leavers' job losses between 1977 and 1983 was: Miscellaneous Services, which accounted for 16.6 per cent of their total job losses and 14.3 per cent of the net decline in their employment. However, this was in part due to the industrial re-classification problem and whether this category would have been the one which accounted for the largest part of male school leavers' employment decline in the absence of such problems cannot be ascertained. Other industrial categories which accounted for a large share of male school leavers' job losses were: Shipbuilding, Marine Engineering and Vehicles; Construction, and, Public Administration and Defence. Between them, these three industrial

Table 2.34

Male school leavers' job gains and job losses in six industry groups, 1977-83

Industrial categories	1977-79		1979-81	
	JG's	JL's	JG's	JL's
Agriculture, Forestry and Fishing	18 (0.6)	0	0	95 (1.0)
Mining and Quarrying	0	52 (2.1)	0	283 (2.9)
Manufacturing Industries	177 (6.0)	2389 (97.9)	0	4084 (42.0)
Construction	749 (25.3)	0	0	720 (7.4)
Gas, Electricity and Water	104 (3.5)	0	0	69 (0.7)
Service Industries	1908 (64.5)	0	0	4478 (46.0)
All industries	2956 (100.0)	2441 (100.0)	0	9729 (100.0)

Industrial categories	1981-83		1977-83	
	JG's	JL's	JG's	JL's
Agriculture, Forestry and Fishing	0	140 (2.1)	18 (0.4)	235 (1.2)
Mining and Quarrying	0	329 (4.9)	0	664 (3.5)
Manufacturing Industries	1071 (100.0)	2125 (31.6)	1248 (31.0)	8598 (45.5)
Construction	0	1096 (16.3)	749 (18.6)	1816 (9.6)
Gas, Electricity and Water	0	96 (1.4)	104 (2.6)	165 (0.9)
Service Industries	0	2949 (43.8)	1908 (47.4)	7427 (39.3)
All industries	1071 (100.0)	6735 (100.0)	4027 (100.0)	18905 (100.0)

Key: JG's = job gains; JL's = job losses. Figures in parentheses are percentages of column total.

categories accounted for a further 29.0 per cent of male school leavers' job losses and 28.0 per cent of their net employment decline over the period 1977–83. It can be seen from these figures that male school leavers' job losses were not as concentrated as female school leavers'. This difference reflected the greater initial concentration of female school leavers' employment.

Table 2.35 shows the share of the six broad industry groups in male school leavers' employment in 1977, their share of male school leavers' net change in employment between 1977 and 1983, and the ratio of the two. From that table it can be seen that the largest proportionate reductions in male school leavers' employment took place in: Mining and Quarrying etc., and the manufacturing industries. The service industries reduced their employment by slightly less than the average proportionate amount, and, Agriculture, Forestry and Fishing; Construction, and, Gas, Electricity and Water reduced their employment by noticeably less than the average proportionate amount.

Table 2.36 shows the same information for the 23 industrial categories. The largest proportionate reductions in male school leavers' employment took place in: Textiles; Bricks, Pottery etc.; Mining and Quarrying etc.; Clothing and Footwear etc.; and, Metal Manufacturing. The smallest proportionate reductions took place in: Insurance, Banking, Finance and Business Services; Agriculture, Forestry and Fishing, and, Electrical Engineering.

2.5.5. Comparing the Experience of Both Genders, 1977–83

This sub-section has two aims, the first is to decompose school leavers' overall net change in employment into both its industrial category and its gender components and the second is to see whether the net decline in school leavers' employment affected one gender more than the other.

To start with the first aim, Table 2.37 shows the percentage of school

Table 2.35

Six industry groups' shares of male school leavers' employment in 1977, net change in employment 1977-1983, and the ratio of the two

Industry Group	(1) % Share of Employment in 1977	(2) % Share of Net Change Employment 1977-83	(3) (2)/(1)
Agriculture, Forestry and Fishing	3.3	1.5	0.5
Mining and Quarrying	2.4	4.5	1.9
Manufacturing Industries	41.8	49.4	1.2
Construction	12.0	7.2	0.6
Gas, Electricity and Water	1.1	0.4	0.4
Service Industries	39.4	37.1	0.9
All Industries	100.0	100.0	-

Table 2.36

The percentage share of the 23 industrial categories in male school leavers' employment in 1977, net change in employment, 1977-83 and the ratio of the two

Industrial category	(1) % share in employment 1977	(2) % share in net change in employment 1977-83	(3) (2)/(1)
1. Agriculture	3.3	1.5	0.4
2. Mining	2.4	4.5	1.9
3. Gas etc	1.1	0.4	0.4
4. Metal Manuf	2.6	4.8	1.8
5. Bricks etc	0.7	1.4	2.0
6. Chemicals	0.9	1.5	1.6
7. Mechanical Eng	6.6	8.0	1.2
8. Electrical Eng	6.2	2.4	0.4
9. Shipbuilding	8.5	13.8	1.6
10. Instrument Eng	1.2	- 0.2	-
11. Food etc	5.3	6.8	1.3
12. Textiles	2.5	5.1	2.1
13. Clothing etc	2.6	5.0	1.9
14. Timber etc	1.8	- 2.8	-
15. Paper etc	2.0	3.0	1.5
16. Other Manuf	0.9	0.6	0.6
17. Construction	12.0	7.2	0.6
18. Dist Trades	12.2	9.0	0.7
19. Misc Services	9.2	14.3	1.5
20. Transport etc	3.6	2.5	0.7
21. Insurance etc	2.8	1.0	0.3
22. Public Admin	9.1	7.0	0.8
23. Prof and Sci	2.5	3.4	1.4
All industries	100.0	100.0	-

Table 2.37

The percentage of school leavers' net total employment change accounted for by either sex in the 23 industrial categories

Industrial Category	Males	Females
1. Agriculture	0.8	0.2
2. Mining	2.4	-0.2
3. Gas etc	0.2	0.4
4. Metal Manuf	2.5	0.2
5. Bricks etc	0.7	0.2
6. Chemicals	0.8	0.9
7. Mechanical Eng	4.2	0.5
8. Electrical Eng	1.3	1.4
9. Shipbuilding	7.3	0.4
10. Instrument Eng	-0.1	1.1
11. Food etc	3.6	3.6
12. Textiles	2.7	3.3
13. Clothing etc	2.6	9.5
14. Timber etc	-1.5	-0.2
15. Paper etc	1.6	2.0
16. Other Manuf	0.3	0.8
17. Construction	3.8	0.5
18. Dist Trades	4.7	9.8
19. Misc Services	7.5	6.7
20. Transport etc	1.3	-0.1
21. Insurance etc	0.5	2.3
22. Public Admin	3.7	1.5
23. Prof & Sci	1.8	2.4
All industries	52.8	47.2

leavers' overall net change in employment accounted for by each gender in each industrial category. It can be seen from that table that the largest single sources of both genders' combined net change in employment were: female school leavers' job losses in Distributive Trades, and, Clothing, Footwear etc. which accounted for 19.3 per cent of both genders' overall net employment decline. In the case of Clothing and Footwear etc., it was accounted for by both female school leavers' high initial concentration of employment in this industrial category and a larger than average proportionate reduction in their employment, and it would have been more obvious still if it had not been for the artificial boost to female school leavers' employment in this category, after 1979, caused by the industrial re-classification problem. In the case of Distributive Trades it was accounted for by the initial concentration of female school leavers' employment alone. Male school leavers might also have been seen to have experienced large job losses in Distributive Trades if it had not been for the artificial boost to this category's share of their total employment occasioned by industrial re-classification problems. The next largest sources of both genders' overall net change in employment were: male school leavers' job losses in Miscellaneous Services, and, Shipbuilding, Marine Engineering and Vehicles, and, female school leavers' job losses in Miscellaneous Services. In all three cases, both the initial concentration of their employment and a larger than average proportionate reduction in their employment were apparently to blame. Male school leavers' employment decline in Miscellaneous Services was artificially boosted by industrial re-classification problems.

Table 2.38 shows the gender composition of both genders' combined job gains, job losses and net change in employment calculated over all the industrial categories. It can be seen from that table, that, over the period 1977-83 taken as a whole, the proportions of both genders' combined net

Table 2.38

The sex composition of school leavers' job gains, job losses and net employment change 1977-83

	1977-79			1979-81			1981-83			1977-83		
	JG	JL	NC	JG	JL	NC	JG	JL	NC	JG	JL	NC
Males	2956	2441	+ 515	0	9729	- 9729	1071	6735	- 5664	4027	18905	-14878
Females	3652	2419	+1233	259	7616	- 7357	124	7282	- 7158	4035	17317	-13282
Total	6608	4860	+1748	259	17345	-17086	1195	14017	-12882	8062	36222	-28160
	%	%	%	%	%	%	%	%	%	%	%	%
Males	44.7	50.2	29.5	0	56.1	56.9	89.6	48.0	44.2	50.0	52.2	52.8
Females	55.3	49.8	70.5	100.0	43.9	43.1	10.4	52.0	55.8	50.0	47.8	47.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Key: JG = job gains
JL = job losses
NC = net change in employment

decline in employment accounted for by each gender was within 2 per cent of the proportions of both genders' combined, total employment accounted for by each gender in 1977, i.e. the net decline was gender neutral. It can also be seen from that table that male school leavers accounted for the majority of the job losses and a minority of the job gains between 1977 and 1981, and that this pattern was reversed between 1981 and 1983. This pattern was, probably accounted for by male school leavers' initial concentration of employment in the manufacturing industries and female school leavers' initial concentration in the service industries, and the difference in the timing of the decline in all ages' employment between these two sets of industries.

Table 2.39 shows female school leavers' share of both genders' combined employment in each industrial category in 1977, their share of the net change in both genders' combined employment in each industrial category between 1977 and 1983, and, the ratio of the two. A figure greater than one in the final column indicates that female school leavers accounted for a greater proportion of both genders' combined net change in employment than they would have been expected to if the change in school leavers' employment had been gender-neutral. Similarly a figure less than one indicates that male school leavers' accounted for a larger proportion of the net change in school leavers' employment than they would have been expected to if the net change had been gender-neutral. A figure of exactly one indicates that the net change was gender-neutral.

From Table 2.39 it can be seen that the gender-neutrality of the net change in school leavers' total employment over the period 1977-83 disguised a somewhat mixed industrial pattern of non-gender neutral, net employment changes. The general pattern was for male school leavers to experience a greater than gender-neutral proportion of the net change in both genders'

Table 2.39

Female school leavers' share of total school leaver employment in 1977, their share of school leavers' total net employment change 1977-83, and the ratio of the two*

Industrial category	(1) % share of employment in each IC, 1977	(2) % share of each IC's net change in employment 1977-83	(3) (2)/(1)
1. Agriculture	15.2	23.0	1.5
2. Mining	3.8	- 7.1	-1.9
3. Gas etc	30.3	67.0	2.2
4. Metal Manuf	11.6	8.6	0.8
5. Bricks etc	25.4	24.9	1.0
6. Chemicals	52.1	54.1	1.0
7. Mechanical Eng	9.1	10.1	1.1
8. Electrical Eng	31.9	52.2	1.6
9. Shipbuilding	6.4	5.4	0.8
10. Instrument Eng	49.0	109.9	2.2
11. Food etc	44.0	50.2	1.1
12. Textiles	59.3	54.8	0.9
13. Clothing etc	81.9	78.3	1.0
14. Timber etc	13.1*	10.0*	0.8
15. Paper etc	47.7	54.9	1.2
16. Other Manuf	50.0	73.7	1.5
17. Construction	8.9	11.8	1.3
18. Dist Trades	59.1	67.3	1.1
19. Misc Services	54.9	46.9	0.9
20. Transport etc	20.6	-12.7	-0.6
21. Insurance etc	74.5	81.6	1.1
22. Public Admin	34.4	28.2	0.8
23. Prof and Sci	77.4	56.5	0.7
All industries	45.3	47.2	1.0

* Both sexes gained jobs in Timber, Furniture etc.

IC = industrial category

combined employment in the manufacturing industries and for females to account for a greater than gender-neutral proportion of the net change in both genders' combined employment in the service industries.

2.5.6. Summary

It was discovered in this section that between 1977 and 1979 school leavers' total employment slightly increased. After 1979, it fell precipitously. Between 1977 and 1983 school leavers' (males and females) total employment fell by nearly 50%.

Until 1979, school leavers' job losses were largely restricted to the manufacturing sector, which was already in secular decline. After 1979, school leavers experienced a substantial number of job losses in both the service and manufacturing industries. In the period 1979 to 1983, the service industries contributed to the largest number of male and female school leavers' job losses. This may seem surprising, since the service industries contributed only a small part (2.5%) of all ages' total job losses in Scotland over the same period. However, the relative stability of all ages' employment in the service industries probably reflected the offsetting of a decline in full-time employment by a rise in part-time employment. Since only a minute fraction of school leavers worked part-time (see Chapter Five), they were affected by the decline in full-time employment but could not gain from the increase in part- time employment.

Finally, over the period 1977 to 1983, the decline in school leavers' employment was gender-neutral. However, this entire period gender-neutrality hid the fact that males' employment fared worse until 1981 and females' employment fared worse thereafter.

2.6. Conclusion

To return to the first of the three themes noted in the introduction, i.e. the differences between male and female school leavers' industrial distributions of employment, one of the main conclusions to be drawn in this Chapter was that male and female school leavers' industrial distributions of employment, the changes in those distributions and the industrial pattern of their net change in employment were quite different. For that reason, the following discussion considers male and female school leavers separately. Furthermore, since quite detailed resumes were provided at the end of sections, the following discussion does not include a detailed account of results.

Turning to the second theme, i.e. the shift towards the service industries, the evidence presented in this Chapter suggests that in the case of female school leavers, there was a large shift away from the manufacturing industries towards the service industries. The particular service industries which increased their shares of female school leavers' total employment were: Professional and Scientific Services; Insurance, Banking, Finance and Business Services, and, Public Administration and Defence, in that relative order. However, industrial re-classification problems had the effect of artificially boosting the gain made by Insurance, Banking, Finance and Business Services and artificially reducing the gain made by Professional and Scientific Services. The large decline in the manufacturing industries' share of female school leavers' employment was largely accounted for by the decline in the relative importance of: Clothing and Footwear etc; Textiles, and, Food, Drink and Tobacco, in that relative order. These trends accord quite well with those derived from the examination of the trends in all ages' employment. The major difference between all ages' and female school leavers' experiences, however, was the sheer scale of the shift away from the manufacturing industries

towards the service industries experienced by female school leavers. This, in turn, suggests that the changes in female school leavers' industrial distribution of employment did not so much reflect secular trends in all ages' industrial distribution of employment as the differential impact across industries of the recession that began in 1979 and, hence, the differential decline in recruitment across industries.

In the case of male school leavers, there was not such a marked shift towards the service industries at the expense of the manufacturing industries. This was because, in their case, there were large shifts within the manufacturing and service industries which tended to cancel one another out. Within the manufacturing sector and more so within the service sector, industrial re-classification problems accounted for a large, but unknown, part of the changes in the relative importance of individual industries. Finally, in the case of male school leavers, the Construction industry noticeably increased its relative importance, in contrast to the experiences of female school leavers and all ages.

Some of the difference in experience between male and female school leavers can be attributed to the less concentrated nature of males' employment within the manufacturing industries. Male school leavers were, therefore, better placed than female school leavers to benefit from the fact that some manufacturing industry's recruitment of school leavers' held up fairly well and, in one case, increased. Consequently, the shift in male school leavers' employment away from the manufacturing industries was smaller than that experienced by females.

Turning now to the third theme, i.e. the industrial pattern of school leavers' net change in employment and the concentration of their employment decline

into just a few industries, the first thing to note is that school leavers' total employment only began to decline after 1979. Between 1977 and 1979, school leavers' total employment increased, because their net job gains in the service industries and, in the case of male school leavers the construction industry, more than offset their net job loss in the manufacturing industries. After 1979, school leavers' total employment declined dramatically as the manufacturing industries produced further large declines in school leavers' employment and the service industries, and most other industrial categories, also began to significantly reduce school leaver employment. After 1979, in the case of male school leavers, and 1981, in the case of female school leavers, the service industries contributed the largest part of school leavers' total job losses. So, the manufacturing industries initiated school leavers' job losses and the service industries later became the prime source of job losses. It was argued in the main body of the Chapter that this sequence of events reflected the difference in the timing of the start of the decline in all ages' total employment between the manufacturing and service industries.

School leavers' net decline in employment was quite highly concentrated, though more so for females than males. In the case of female school leavers, 55% of their net decline in employment, between 1977 and 1983, was accounted for by just three industrial categories, i.e. Distributive Trades; Clothing and Footwear etc, and, Miscellaneous Services, and this concentration would have been even greater had it not been for the artificial boost to female school leavers' employment in Clothing and Footwear etc., caused by industrial re-classification problems. In the case of male school leavers, 42.3% of the net decline in their employment, between 1977 and 1983, was accounted for by three industrial categories, i.e. Miscellaneous Services; Shipbuilding, Marine Engineering and Vehicles, and, Public Administration and Defence. Industrial

re-classification problems artificially boosted the role of Miscellaneous Services in accounting for male school leavers' employment decline, however.

To conclude, the changes in female and male Scottish school leavers' industrial distributions of employment over the period 1977 to 1983 were quite marked. It seems likely that they owed a great deal to the recession that started in 1979 and its uneven impact across industries. Since occupational and industrial change are closely linked, the changes in female and male Scottish school leavers' industrial distributions of employment will have been reflected in the changes in their occupational distributions of employment, and it is the changes in Scottish school leavers' occupational distribution of employment that form the subject of the next chapter.

Footnotes

1. See Main (1987, forthcoming) for an account of governmental policy with respect to the youth labour market.

2. This relationship between an industry's expansion in employment and the recruitment of school leavers might have been attenuated during the period of study due to the fact that high levels of unemployment amongst older workers may have allowed firms to recruit older workers in preference to school leavers. (See Chapter One)

3. See Marsden and Ryan (1986) for the source of the following discussion of the quality of young peoples' employment and its relationship to their industrial distribution of employment.

4. Raffe (1983a) concludes from his study of employment instability among less-qualified Scottish school leavers in 1979, that the major cause of their employment instability was the low quality of the jobs which they obtained.

5. Exceptions include: the study specially commissioned by The National Youth Employment Council (NYEC) and reported in NYEC (1974), the study of the changes in the age structure of the labour force in industry over the period 1951-75 contained in Jolly *et al.* (1980), the brief comments on the results obtained from The New Entrants to Employment Surveys conducted in England and Wales in 1978, 1979, 1980 and 1983, contained in a number of short articles in The Employment Gazette (Department of Employment, 1984a, 1984b) and the series of articles based on the SEDA data set (Macleod, Main and Raffe, 1983; Main and Raffe, 1983c; Seatter, 1983; and Raffe, 1984a).

6. The sources referred to in Figure 2.1 are: Cipolla, Carlo, M. (Ed) "The Fontana Economic History of Europe", Vols III and IV, London, Fontana/Collins, 1973. Hartwell, R.M. in "The Service Revolution: The Growth of Services in The Modern Economy, 1700-1914" in Cipolla. Kuznets, S. "Modern Economic Growth: Rate, Structure and Spread" NewHaven, Yale, University Press, 1966. Deane, P. and Cole, W.A. "British Economic Growth 1688-1859" Cambridge, Cambridge University Press, 1967.

7. The intermediate category in Table 2.1 includes such industries as transport and communication. Series A and series B relate to different methods of coding individual's industry of employment.

8. The production industries are conventionally defined as: manufacturing, transport and communications, mining and quarrying etc and the utilities, i.e. gas, water and electricity.

9. For instance, the postman delivering letters in the 1980's is probably not much more productive than his/her counterpart in the 1880's. On the other hand, the secretary of the 1980's, equipped with word processors, photocopiers etc. is probably much more productive than his/her counterpart in the 1880's. So this argument is not as clear cut as it might initially appear.

10. The detailed assumptions concerning the growth of world income, UK GDP

etc are contained in the first chapter of (IER, 1985). Actual data was used for the years 1981 to 1984 and forecast data used thereafter.

11. The study entitled "Occupation Trends in the UK to 1990" was commissioned by The Occupational Studies Group, which is concerned with providing information on occupational trends for commercial and governmental use. The final report was edited by Amin Rajan and Richard Pearson.

    The aim of the study was to discover emerging occupational trends and to examine their causes. The method adopted was an employer-based survey. The survey aimed to cover all the industries contained in the 1980 Standard Industrial Classification and all the standard regions in the UK in a representative way. The fieldwork for the survey was carried out in the latter half of 1985.

12. The analysis in this paper is based upon the information provided by school leaver's valid responses only. That is, the category "inadequately described" is not retained in the analysis. There are two main reasons for this. Firstly, the figures relating to all ages' employment to be discussed in Chapter Five do not include such a category. Since the figures relating to school leavers used there will at that stage have to be based upon the valid responses only, it seems sensible to apply this restriction to all the analysis; for the sake of compatibility. Secondly, the act of using only the valid responses can be seen as a way of making better use of the information provided by the sample than the alternative procedure of keeping a separate "inadequately described" category.

    Using the valid responses only is equivalent to implicitly assuming that the "inadequately described" responses had the same probability of coming from a particular industrial category as the known responses have of coming from that particular industrial category. That is, it is implicitly assumed that the "inadequately described" responses have a greater chance of coming from industrial categories with a large share of the known responses than from one with a small share of the known responses. Whilst this assumption is unlikely to be strictly true, and its adoption will therefore lead to some biases in the percentages reported, these biases are unlikely to be as high as those resulting from the artificial diminution of the reported percentages, in each industrial category, caused by the retention of a separate "inadequately described" category. This latter procedure implicitly assumes a zero probability of the "inadequately described" responses coming from any of the 23 industrial categories and therefore ignores the information already contained in the sample.

CHAPTER 3

THE CHANGING OCCUPATIONAL DISTRIBUTION OF SCOTTISH SCHOOL LEAVERS' EMPLOYMENT, 1977-83

3.1. Introduction

3.1.1. Preview

The aims in this Chapter are to examine Scottish school leavers' occupational distribution of employment, the changes in that distribution and the occupational pattern of school leavers' absolute change in employment, over the period 1977-83. In this Chapter three themes will be pursued. Firstly, the extent to which male and female school leavers' occupational distributions of employment differed. Of particular interest is the extent to which female school leavers were required to choose from a restricted sub-set of occupations and the extent to which the decline in school leavers' total employment after 1979 increased the occupational gender segregation of school leavers' employment. The second theme is the extent to which the trends in school leavers' occupational distribution of employment mirrored those in the occupational distribution of all ages' employment. The final theme is the extent to which the decline in school leavers' employment was concentrated in a limited subset of occupations.

The three justifications, provided in Chapter Two, for studying Scottish school leavers' industrial distribution of employment can also be used to justify the study of their occupational distribution of employment. The present exercise can therefore be justified on the grounds that, firstly, the information it provides can be used to better target expenditure by the State on youth training. Secondly, that light may be thrown on emerging occupational trends. Finally, one might be concerned with school leaver's welfare and hence

interested in whether they worked in "good" or "bad" occupations.

As with the industrial distribution of school leavers' employment, there has not been a great deal of work on school leavers', or young peoples', occupational distribution of employment (see Jolly *et al*, 1980; Ashton and Maguire, 1982; Ashton and Maguire, 1986; and Roberts *et al*, 1986; for exceptions). The previous work is now either rather dated (Jolly *et al*, 1980) or based on smaller samples than those employed here. It is to be hoped, therefore, that the contents of this Chapter will offer a significant contribution to the study of young peoples' employment.

3.1.2. The Recent Changes in All Ages' Occupational Distribution of Employment

The information to be presented in this sub-section is derived from seven studies, namely, Kendrick (1985a), Elias (1985), Parsons (1985), Elias and Wilson (1986), Rajan and Pearson (1986), which are all studies of occupational change, and, Hakim (1979) and Hakim (1981), which are both studies of occupational gender segregation. Kendrick's (1985a) study is a study of occupational change in Scotland, over the period 1961 to 1981.[1] His analysis is based upon the results of the population Censuses for Scotland, conducted in 1961, 1971 and 1981. Elias' (1985) study is based on the population Census results for the United Kingdom, for 1971 and 1981. Parson's (1985) study of occupational change was based upon the 1971 and 1981 Census results for England and Wales. Elias and Wilson's (1986) study employed data from the 1971 and 1981 Censuses for the UK and data from The Labour Force Survey for the years after 1981. Rajan and Pearson's (1986) study was based upon data relating to employers' expectations of occupational trends up to 1990.

Hakim's (1979) study was primarily concerned with occupational gender

segregation in Britain, until 1971. It is now, unfortunately, rather dated but it is still useful as a source of data concerning long term trends in occupational segregation. Hakim's (1981) study used Labour Force Survey data for the years 1971 to 1979 in order to examine trends in occupational gender segregation in the 1970's.

Starting with the studies of all ages' occupational distribution of employment and turning first to the results of Kendrick's (1985a) and Elias' (1985) studies, Table 3.1a shows the five largest occupational categories for females in 1971 and 1981, and Table 3.1b shows the same for males. Table 3.1c shows the percentage of males' and females' total employment in white collar and manual occupations, in Scotland and the United Kingdom, in 1971 and 1981. It can be seen from Tables 3.1a, 3.1b and 3.1c that the male and female occupational distributions of employment were very different. Females tended to be relatively[2] concentrated in white collar and personal service occupations, and the less skilled and less senior occupational categories. Males, on the other hand, tended to be relatively concentrated in manual occupations, especially skilled manual occupations, and they tended to be relatively concentrated in all the skilled occupational categories. From Table 3.1c it can be seen that both genders' employment shifted away from manual towards white collar occupations, between 1971 and 1981.

The main changes in all ages' occupational distributions of employment in Scotland between 1961 and 1981, and, in the United Kingdom, between 1971 and 1981, are reported in Table 3.2. This table contains a distillation of the changes noted by Kendrick (1985a) and Elias (1985), or shown in their tables. It can be seen from Table 3.2 that the main change was a shift away from manual jobs, especially in manufacturing, toward white collar jobs, especially professional occupations and managerial jobs. In particular, males lost skilled

Table 3.1a

The five largest female occupational categories in Scotland and the United Kingdom, 1971 and 1981

Study Area	Kendrick (1985) Scotland				Elias (1985) United Kingdom			
Year	1971		1981		1971		1981	
1.	Junior Non Manual	(36.7)	Junior Non Manual	(37.5)	Clerical Occupations	(19.6)	Clerical Occupations	(19.9)
2.	Semi-Skilled Manual[2]	(14.6)	Intermediate Non Manual	(16.4)	Other Personal Service Occupations	(16.8)	Other Personal Service Occupations	(16.3)
3.	Personal Service	(12.9)	Personal Service	(13.9	Other Operatives	(13.6)	Skilled Personal Service Occupations	(9.9)
4.	Intermediate Non Manual	(12.6)	Semi-Skilled Manual	(9.6)	Secretarial Occupations	(9.4)	Secretarial Occupations	(9.5)
5.	Unskilled Manual[1]	(8.9)	Unskilled Manual	(8.5)	Skilled Personal Service Occupations	(9.4)	Other Operatives	(9.3)
Total		(85.7)[4]		(85.9)		(68.8)		(64.9)

Sources: Kendrick (1985) Table 2F, Elias (1985) Table 4.

Notes: (1) Kendrick's (1985) "Unskilled Manual" category is very roughly equivalent to Elias' (1985) "Other Personal Service Occupations" category. These categories mainly consist of office cleaners and domestic helps.

(2) Kendrick's (1985) "Semi-skilled Manual" category is very roughly equivalent to Elias' (1985) "Other Operatives" category. Both consist of mainly manufacturing based occupations.

(3) Kendrick's (1985) "Junior Non Manual" category is very roughly equivalent to Elias' (1985) "Clerical Occupations" category.

(4) The figures in parentheses are percentages of each sample.

Table 3.1b

The five largest male occupational categories in Scotland and the United Kingdom, 1971 and 1981

Study Area	Kendrick (1985) Scotland			Elias (1985) United Kingdom			
Year	1971		1981	1971		1981	
1.	Skilled Manual	(31.9)	1. Skilled Manual	(29.7)	1. Other Operatives	(24.3)	1. Other Operatives	(21.5)
2.	Semi-Skilled Manual	(14.5)	2. Semi-Skilled Manual	(13.9)	2. Engineering Craftsmen Occupations (Module)	(9.6)	2. Engineering Craft Occupations (Module)	(9.3)
3.	Employers and Managers	(10.4)	3. Employers and Managers	(12.6)	3. Skilled Personal Service Occupations	(8.1)	3. Skilled Personal Service Occupations	(9.0)
4.	Junior Non Manual	(10.1)	4. Junior Non Manual	(9.4)	4. Clerical Occupations	(6.0)	4. Other Professions	(5.7)
5.	Unskilled Manual	(8.9)	5. Intermediate Non Manual	(7.7)	5. Construction Craft Occupations	(5.4)	5. Construction Craft Occupations	(5.5)
Total		(75.8)		(73.3)		(53.4)		(51.0)

Sources: Kendrick (1985) Table 2M, Elias (1985) Table 3.

Notes: (1) See notes (1) to (3) to Table 1a.

(2) Elias' (1985) "Skilled Personal Service Occupations" category contains some of the occupation titles in Kendrick's (1985) "Employers and Managers" category.

(3) Elias' (1985) "Engineering Craft Occupations (Module)" would form part of Kendrick's (1985) "Skilled Manual" category.

Table 3.1c

The percentage of males' and females' employment in white collar and manual occupations, in Scotland and the United Kingdom, 1971 and 1981

Study Area	Kendrick (1985) Scotland	Elias (1985) United Kingdom	Kendrick (1985) Scotland	Elias (1985) United Kingdom	Kendrick (1985) Scotland	Elias (1985) United Kingdom	Kendrick (1985) Scotland	Elias (1985) United Kingdom
Year	1971		1981		1971		1981	
Sex	Males		Males		Females		Females	
White Collar[1] Occupations	31.5	27.7	36.7	31.9	67.1	51.2	74.3	56.9
Manual Occupations[2]	68.2	72.0	62.8	67.6	32.1	48.3	24.7	42.8
Inadequately Described[3]	0.4	0.4	0.7	0.4	0.8	0.4	0.8	0.4
All Occupations	100.1	100.1	100.2	99.9	100.0	99.9	99.8	100.1

Source: Figures derived by author from Kendrick (1985) Tables 2M and 2F; Elias (1985) Tables 3 and 4.

(1) For Kendrick's (1985) this includes SEG's 1 to 7; for Elias' (1985) this includes WOC's 1 to 11.

(2) For Kendrick's (1985) this includes SEG's 7 to 16, for Elias' (1985) this includes WOC's 1 to 24.

(3) For Kendrick's (1985) this is SEG 17; for Elias' (1985) it is WOC 25.

Table 3.7

Changes in males' and females' occupational distributions of employment in Scotland between 1961 and 1981 and the United Kingdom between 1971 and 1981

Scotland, 1961-81[1],[2]	Main Changes:	United Kingdom, 1971-81[3]
1. Sustained growth in the number of males recorded as managers		1a. An increase in the share of males' total employment accounted for by Managers and Administrators; Other Professions; Engineers, Scientists etc; and, Skilled Personal Service Occupations (mainly managers in the service sector).
2. Sustained growth in the number of females in teaching and nursing professions.		1b. Large absolute increase in males' employment in Managers and Administrators, Other Professions, and, Engineers, Scientists etc.
3. Sustained growth in the number of clerical workers, especially for females. Clerical occupations increasingly a female preserve. Little change in the number of female secretaries.		2a. An increase in the share of females' total employment accounted for by Education Professions; Health, Welfare Professions, and, Other Professions.
4. Sustained growth in the number of females in Personal Service Occupations.		2b. Large absolute increases in females' employment in Health, Welfare Professions, Education Professions; Other Professions.
5. Decline in the number of Skilled Manual workers, especially for females.		3a. Large absolute increase in females' employment in Clerical Occupations.
6. Decline in the number of unskilled workers.		3b. Absolute decrease in males' employment in Clerical Occupations.
		4. Large absolute increase in females' employment in Skilled Personal Service Occupations.
		5a. Large absolute decrease in males' employment in Engineering Craft Occupations (Module) and Skilled Operatives.
		5b. Large absolute decline in females' employment in Skilled Operatives.
		6a. A decline in the share of males' employment accounted for by Other Operatives and Other Occupations.
		6b. A decline in the share of females' employment accounted for by Other Operatives.
		6c. Large decline in the number of males in Other Operatives and Other Occupations.
		6d. Large decline in the number of females in Other Operatives.

Other Changes:

1. Decline in females' employment as Sewers, Embroiderers.
2. Decline in the number of agricultural workers (both sexes).
3. An increase in the number of workers on own account.

Notes (1) These changes are either those reported by Kendrick (1985), or, derived from his tables.

(2) Whilst an attempt has been made to match the results between studies, this match may not always be exact. However, only those results which were very similar have been reported under the heading "Main Changes".

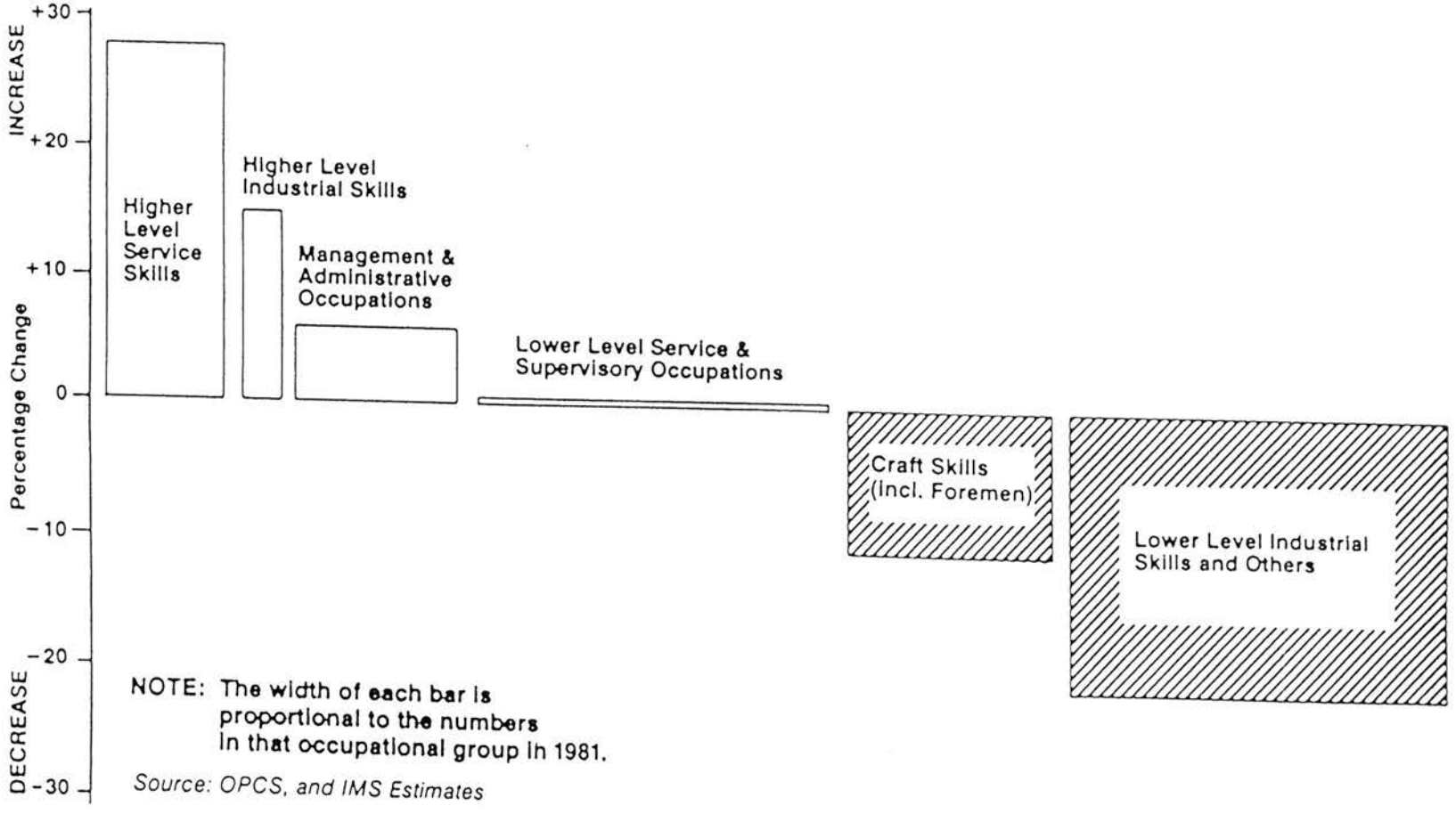
(3) These changes are either those reported by Elias (1985), or, derived from his tables.

jobs and unskilled jobs in manufacturing and construction, and gained jobs in managerial and professional occupations; whilst females lost skilled and unskilled jobs in manufacturing and gained jobs in health, welfare and teaching professions, clerical occupations and personal service occupations.

Figure 3.1, taken from Parsons (1985), shows the shift away from manual, and especially unskilled manual occupations, and towards professional and related occupations and managerial occupations, principally in the service industries, in England and Wales, between 1971 and 1981. From Table 3.3, taken from Elias and Wilson (1986), it can be seen that, in the period 1981 to 1984, that there were increases in employment in professional, technical, managerial, sales, literary, artistic and sports and construction occupations. It can also be seen that there were decreases in engineering-related and craft occupations, shop-floor management occupations and other operatives, i.e. factory operatives. It can be seen from Figure 3.2, taken from Elias and Wilson (1986), and Figure 3.3, taken from Rajan and Pearson (1986), that the decrease in employment in manual and less skilled occupations and increase in employment in professional, technical, and, managerial occupations is forecast to continue till 1990.

Turning to the issue of occupational gender segregation Table 3.4a, based on Kendrick's (1985a) and Elias' (1985) studies, shows the occupational categories in which females comprised a larger proportion of that occupational category's employment than they did of total, i.e. both genders combined, employment. Table 3.4b shows the occupational categories in which males accounted for more than 80% of that category's workforce. From Table 3.4a, it can be seen that females' share of employment exceeded their share of total employment in: junior white collar, (clerical and secretarial, occupations) personal service occupations, and, health and welfare occupations. From Table

Figure 3.1 **Changes in Occupation 1971-1981**



Source: Parsons (1985), Figure 3.8

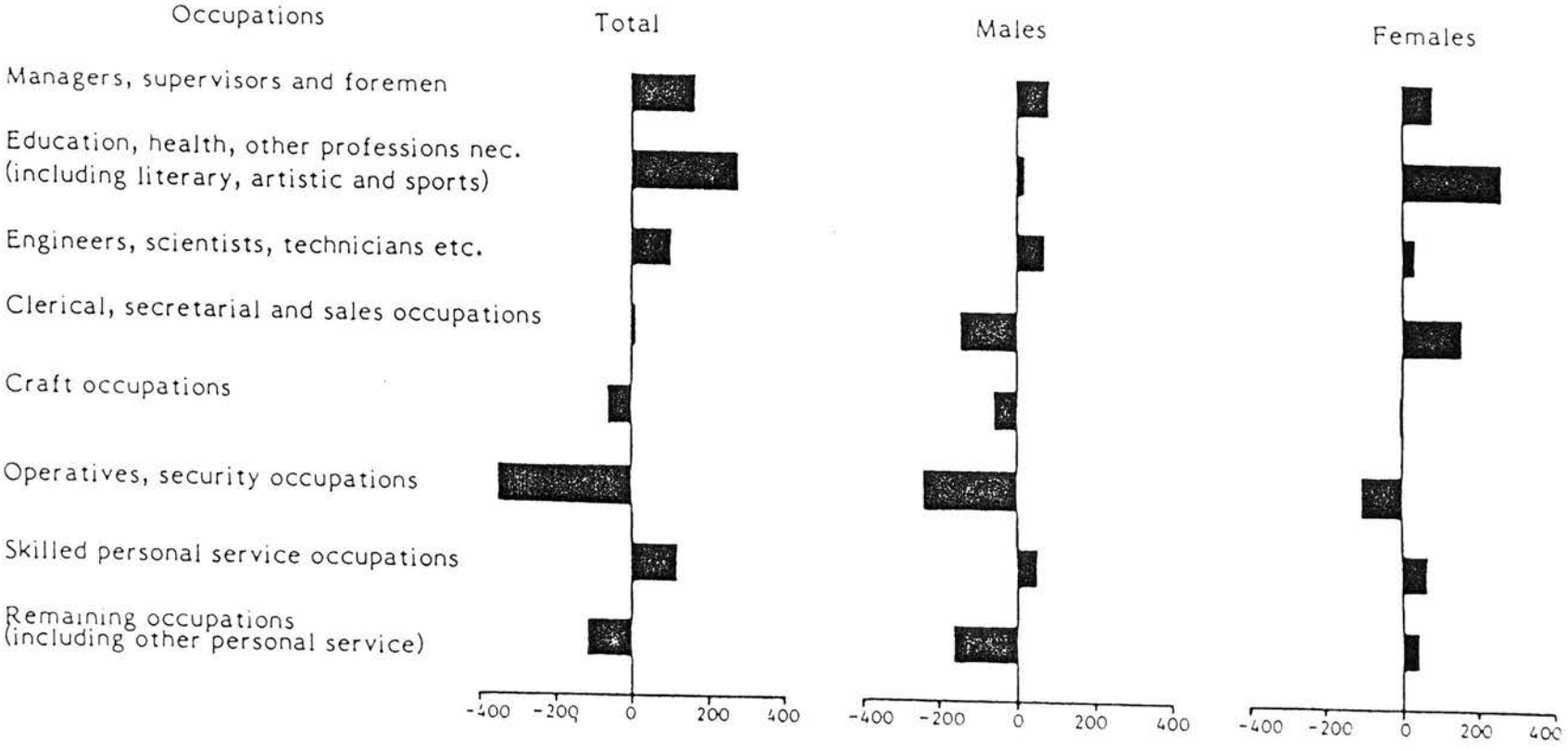
Table 3.3 Occupational Change 1971-90

MOC	Occupation	1971 level	Change (thousands) 1971-81	1981-84	1984-90	Change (% p.a.) 1971-81	1981-84	1984-90	1990 level
1	Managers and administrators	577	152	11	82	2.37	0.53	1.77	823
2	Education professions	785	171	35	-9	1.98	1.19	-0.15	982
3	Health welfare professions	753	295	94	146	3.36	2.91	2.01	1,288
4	Other professions	835	241	86	114	2.56	2.60	1.57	1,275
5	Literary, artistic, sports occupations	154	43	30	28	2.52	4.83	1.94	255
6	Engineers, scientists etc.	455	153	41	78	2.93	2.22	1.91	726
7	Technicians, draughtsmen	422	50	49	27	1.13	3.35	0.83	548
8	Clerical occupations	2,703	20	-30	-30	0.07	-0.98	-0.18	2,613
9	Secretarial occupations	843	114	-23	66	1.27	-0.81	1.15	1,000
10	Sales representatives	420	-29	14	-24	-0.70	1.15	-1.01	381
11	Other sales occupations	1,075	52	84	7	0.47	2.44	0.10	1,217
12	Supervisors	208	113	-20	72	4.45	-2.08	3.65	374
13	Foremen	577	-13	-100	11	-0.23	-6.32	0.38	474
14	Engineering craft occupations (module)	1,500	-150	-96	-46	-1.05	-2.42	-0.63	1,208
15	Engineering craft occupations (non-module)	514	-55	-37	3	-1.11	-2.78	0.12	425
16	Construction craft occupations	816	-66	82	15	-0.84	3.51	0.30	847
17	Other craft occupations	376	-100	-53	-29	-3.06	-6.90	-2.35	193
18	Skilled operatives	1,008	-237	-84	-77	-2.64	3.77	-1.96	610
19	Other operatives	4,974	-975	-423	-297	-2.16	-3.67	-1.43	3,279
20	Security occupations	259	60	-15	12	2.12	-1.56	0.62	317
21	Skilled personal service occupations	2,150	228	45	121	1.01	0.63	0.82	2,544
22	Other personal service occupations	1,761	133	44	31	0.74	0.76	0.26	1,969
23	Other occupations	980	-361	-18	-152	-4.48	-1.01	-4.75	449
1-23	All occupations	24,146	-159	-335	145	-0.07	-0.47	0.10	23,797

Note: Excluding HM Forces.

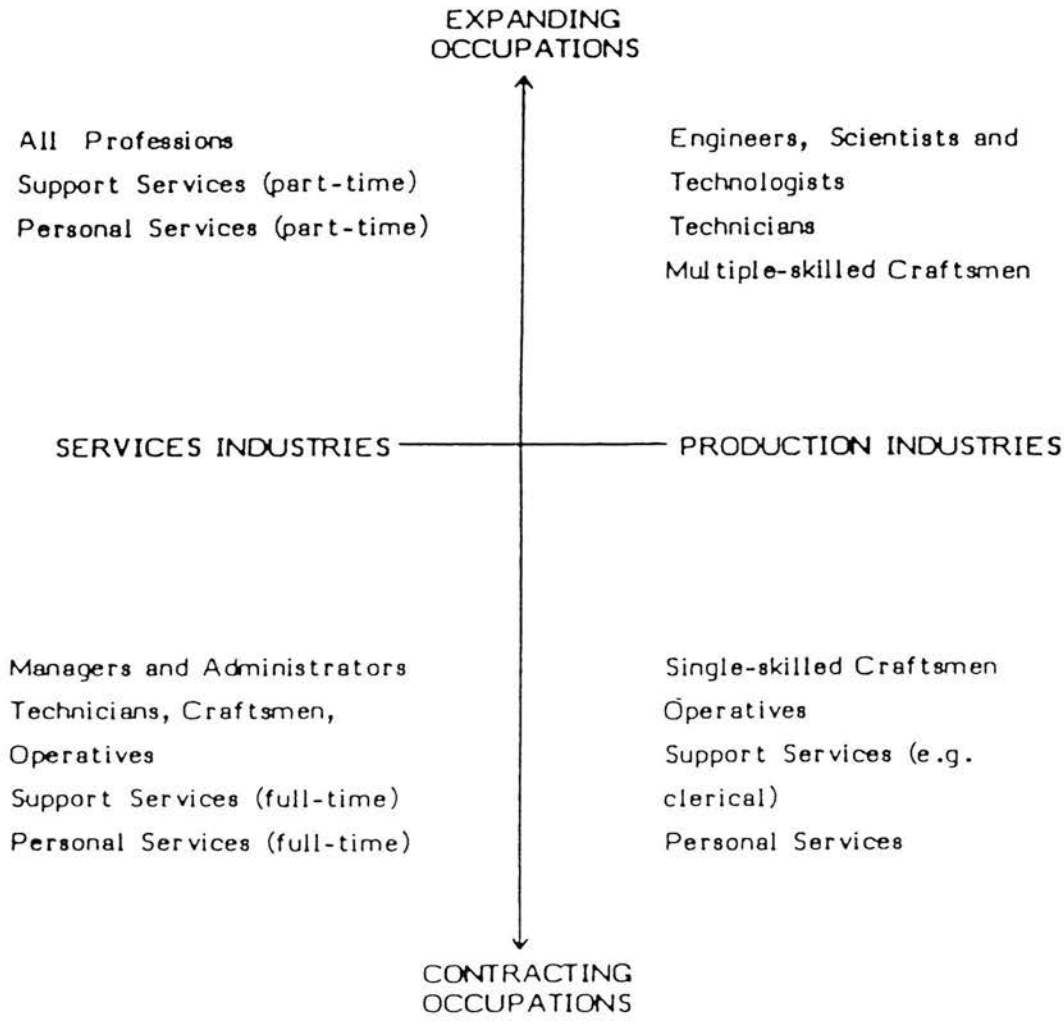
Source: Elias and Wilson(1986), Table 1.2

Figure 3.2 Summary of Projected Occupational Change 1984–90 (Thousands)



Source: Elias and Wilson (1986), Figure 1.1

Figure 3.3 The Changing Occupational Balance



Source: Rajan and Pearson (1986), Figure 3

Table 3.4a

Occupational categories in which females' share of employment exceeded their share of total employment(1) in Scotland and the United Kingdom in 1981

Study Area	Kendrick (1985) Scotland	Elias (1985) United Kingdom
1.	Personal Services.	Secretarial Occupations.
2.	Junior Non Manual	Other Personal Service Occupations.
3.	Intermediate Non Manual	Other Sales Occupations.
4.		Health, Welfare Professions.
5.		Clerical Occupations.
6.		Supervisors.
7.		Literary, Artistic and Sports Occupations.
8.		Skilled Operatives.

Source: Based on a re-working of Kendrick's (1985) Tables 1M and 1F and Elias' (1985) Table 2.(2)

Notes: (1) The occupational categories are ranked according to the extent to which females' share of that occupational category's employment exceeds their share of total employment.

(2) The figures contained in Elias' (1985) Table 2 are population figures obtained by grossing up the sample estimates from the 1981 Labour Force Survey.

Table 3.4b

The occupational categories in which males represented more than 80% of employees in Scotland and the United Kingdom, in 1981(1)

Study Area	Kendrick (1985) Scotland	Elias (1985) United Kingdom
1.	Armed Forces	Construction Craft Occupations
2.	Farmers - Employers and Managers	Engineering Craftsmen (Non-Module)
3.	Skilled Manual	Engineering Craftsmen (Module)
4.	Farmers - Own Account	Armed Forces
5.	Foremen and Supervisors - (Manual)	Other Occupations
6.	Agricultural Workers	Engineers, Scientists etc.
7.	Professionals	Managers and Administrators
8.	Own Account Workers	Foremen
9.		Security Occupations
10.		Other Craft Occupations
11.		Technicians, Draughtsmen
12.		Sales Representatives

Source: Based on a reworking of Kendrick's (1985) Tables 1F and 1M, and, Elias' (1985) Table 2.

Notes: (1) The occupational categories are ranked according to the extent to which males represent more than 80% of their employment.

(2) See Note (2) Table 3a.

3.4b, it can be seen that females (males) were particularly under (over) represented in: agricultural occupations, most senior white collar occupations, security occupations and, skilled and responsible manual occupations. That is, females were usually found on the lower rungs of occupational ladders.

By reworking Kendrick's (1985a) and Elias' (1985) figures, it is possible to calculate the value in 1971 and 1981, of the Duncan-Duncan index of occupational gender segregation (see Appendix 3.2 for a definition of this measure) in order to discover if the occupational segregation of all ages' employment, changed between 1971 and 1981.[3] According to Kendrick's figures the value of the index was 45.6 in 1971 and 52.2 in 1981; according to Elias' figures the value of the index was 53.7 in 1971 and 55.7 in 1981. These figures suggest that the occupational segregation of the gender's employment slightly increased between 1971 and 1981.

Turning now to Hakim's two studies of occupational gender segregation, Hakim (1979) distinguished between two types of occupational segregation: horizontal and vertical. Horizontal segregation "exists when different types of work are allocated to men and women" (Hakim, 1979; pp 43). Vertical segregation, on the other hand, "exists when men and women both participate in various fields of work, but women are disproportionately concentrated in the lower grades of work, and men are disproportionately concentrated in the higher grades, whether these are defined in terms of skill, responsibility, prestige, or financial reward" (Hakim, 1979; pp 43).

Hakim's (1979) main findings were that, firstly, the degree of horizontal segregation had slightly decreased, over the period 1901 to 1971. Secondly, that there was a long term trend towards a greater degree of vertical segregation. Thirdly, there was a reduction in the number of occupations

exclusively filled by one gender between 1901 and 1971. Hakim's (1979) overall conclusion was that there had been a process of continuity within change and that there had been few major changes in occupational gender segregation in Britain, over the period 1901 to 1971. The main finding in Hakim (1981) was that the introduction of equal opportunities legislation, that is, The Equal Pay Act (1970) and The Sex Discrimination Act (1975) (both of which came into force in December 1975) "had a very marked and dramatic impact within a very short space of time. However some or all of these gains were then lost in the reversed trend in the latter part of the decade" (Hakim; 1981, p525). By 1979, Hakim's (1981) index of horizontal segregation (see Appendix 3.2) was very nearly back at its 1971 value.

In conclusion, the main results noted in this sub-section were: firstly, in recent years there has been an increase in all ages' employment in white collar occupations, particularly professional, technical and artistic occupations, mainly in the service industries, and a decrease in all ages' employment in manual and unskilled occupations, principally in the manufacturing industries. Secondly, women's employment was relatively concentrated in white collar and personal service occupations; and in less skilled and less senior occupations. Males, on the other hand, were relatively concentrated in manual, especially skilled manual, occupations and more senior occupations. Finally, there was a sharp increase in the degree of horizontal segregation at the end of the 1970's. The above is, then, the wider background within which the changes in school leavers' occupational distribution of employment will be considered.

3.1.3. The Rest of the Chapter

The general outline of the rest of this Chapter is as follows. Section 3.2 contains the analysis of Scottish school leavers' occupational distribution of employment in 1977, 1979, 1981 and 1983, and the changes in their

occupational distribution of employment between 1977 and 1983. Section 3.3 contains the analysis of the occupational pattern of Scottish school leavers' absolute change in employment between 1977 and 1983. Section 3.4 contains concluding remarks.

3.2. The Changing Occupational Distribution of Scottish School Leavers' Employment, 1977–83

3.2.1. Introduction

In this section, Scottish school leavers' occupational distributions of employment in 1977, 1979, 1981 and 1983 are examined and the changes in their occupational distribution of employment over the period 1977 to 1983 are discussed. The analysis is based upon the replies given to the question: "Please describe the actual work you do in your job" or variants of that question, plus supporting questions. The replies given by school leavers have been recoded to the Warwick Occupational Categories (WOC's). The data used here is restricted in the same ways as the data used in the industrial analysis contained in Chapter Two. That is, it is restricted to four regions in Scotland, i.e. Tayside, Lothian, Strathclyde and Fife, and to school leavers who attended state sector schools. These restrictions were applied because in 1977 non-certificated leavers were only included in the four regions listed above and Shetland, because the sampling arrangements for non-state schools were felt to be unsatisfactory and, finally, because the weighting factors were not available for Shetland. For the sake of consistency, these restrictions were applied to the data from all four surveys. The data utilised below has been weighted in order to take into account known non-response and disproportionate stratification associated with respondent's gender and Scottish Certificate of Education attainment.

3.2.2. Finding a Suitable Occupational Classification Schema

Before the analysis could be begun, it was necessary to find a suitable occupational classification. The occupational classification employed in this Chapter is the pre-1985 Warwick Occupational Classification. The Warwick Occupational Categories[4] were developed by Peter Elias and The Manpower Research Group at the University of Warwick, for the purpose of analysing occupational trends, using data from the 1961, 1966 and 1971 Population Censuses (Elias, 1981). The Warwick Occupational Categories (WOCs) were based upon the 223 Occupation Unit Groups of The 1970 Classification of Occupations, and take no account of employment status.[5] The eighteen WOCs of the pre-1985 Warwick Occupational Category schema "were intended to reflect differences in the extent of industrial training for manual jobs and in the level of professional qualifications and/or vocational training associated with non-manual occupations" (Elias, 1985 pp 2).

The WOC has three main advantages for present purposes. Firstly, it is based on an economic criteria, the extent of training etc., which has been shown elsewhere to be important in determining whether school leavers are employed in preference to older workers.[6] Secondly, the WOC had the advantage of a readily available conversion of its categories from The 1970 Classification of Occupations to The 1980 Classification of Occupations (see Appendix 3.1 for details of how this conversion was achieved). Finally, in a study (Arber *et al*, 1985) of the ability of various occupational classification schema (including the pre-1985 WOC and a seven category version of the Hope-Goldthorpe Scale (Goldthorpe and Llewellyn, 1979)) to distinguish between male-dominated and female-dominated occupations and the "market situation" of various occupations, the WOC was found to be particularly good at distinguishing male-dominated from female-dominated occupational categories

and for distinguishing between those occupational categories filled by the educationally qualified and unqualified. Since parts of the present analysis will be concerned with occupational gender segregation the former result was particularly germane.

Finally, it should be recognised that, in common with all classifications based on official classifications, the WOC possesses two features which make it better suited to the analysis of males' and adults' occupational distribution of employment than the occupational distributions of females' and young peoples' employment. Firstly, Hakim (1979) draws attention to the fact that official classifications of occupations possess much finer distinctions between traditionally male-dominated occupations than between traditionally female-dominated occupations. Thus, by their very design, the official classifications will give a more striking impression of females' concentration of employment in certain occupations than of males' concentration of employment. The second feature of official classifications which limits their applicability to school leavers is the fact that they were created with all ages' occupational distribution of employment in mind. School leavers are found in only a subset of all ages' occupations, predominantly the bottom rungs of occupational ladders. The official classifications, therefore, contain too great a breadth of occupational titles for school leavers, and any classification based upon them will usually have some nearly empty categories for school leavers. The above comments suggest that these two limitations will combine in the case of female school leavers.

3.2.3. The Analysis for Both Genders Taken Together

Table 3.5 shows the percentage of both genders' combined school leavers' employment in each of the eighteen WOC's, along with the rank of each WOC, and the unweighted N's relating to each survey. The first thing to notice from

Table 3.5

The occupational distribution of Scottish school leavers' employment, both sexes, with rank, 1977, 1979, 1981 and 1983

Occupational Category	%				Rank			
	1977	1979	1981	1983	1977	1979	1981	1983
Managers and administrators	1.2	1.0	1.2	0.5	13	13	13	15
Education professions	0.1	0.0	0.1	0.1	17	17	17	17
Health professions etc	2.5	2.3	4.2	5.5	11	11	8	7
Other professions	0.2	0.4	0.4	0.2	16	16	16	16
Literary, artistic and sports occupations	0.7	0.6	0.9	0.8	14	15	14	13
Engineers, scientists etc	0.3	0.7	0.6	0.7	15	14	15	14
Technicians, draughtsmen	2.8	3.0	2.3	1.2	9	10	11	11
Clerical occupations etc	21.0	23.2	24.5	25.4	1	1	1	1
Sales occupations	9.3	11.3	10.5	9.3	5	4	4	4
Supervisors, foremen	0.0	0.0	0.0	0.0	18	17	18	18
Engineering craftsmen	15.1	15.2	14.0	15.1	3	2	2	3
Other transferable craftsmen	5.1	4.8	5.8	7.4	7	7	6	5
Non-transferable craftsmen	10.1	7.1	5.0	4.8	4	5	7	8
Skilled operatives	4.3	3.6	3.6	2.9	8	9	9	9
Other operatives	16.0	14.9	13.8	15.3	2	3	3	2
Security occupations	2.8	2.3	3.3	2.6	9	11	10	10
Personal service occupations	6.2	5.6	7.6	7.0	6	6	5	6
Other occupations	2.3	3.8	2.2	1.1	12	8	12	12
Unweighted N's	4244	4173	7505	1707	-	-	-	-

Source: SEDA

Table 3.5 is how concentrated school leavers' occupational distribution of employment was in each of the four years. The largest three individual categories: Clerical Occupations etc; Engineering Craftsmen, and, Other Operatives, accounted for over half of all school leavers' employment in each of the four years, i.e. 52.1%, 53.3%, 52.3% and 55.8%, in 1977, 1979, 1981 and 1983, respectively. The largest single occupational category was Clerical Occupations etc., which accounted for a fifth of school leavers' total employment in 1977, and which grew in relative importance until, in 1983, it accounted for just over a quarter of school leavers' total employment. The concentration of school leavers' employment in Clerical Occupations etc., mainly reflected the recruitment of female school leavers to the bottom rungs of white collar occupational ladders, e.g. as secretaries, junior clerks, etc. The concentration of school leavers' employment in the Engineering Craftsmen category largely reflected the recruitment of male school leavers as apprentices. Finally, the concentration of school leavers' employment in the Other Operatives category reflected both male and female school leavers' employment in unskilled and semi-skilled manual jobs; predominantly in the manufacturing industries.

Occupational categories which accounted for a small percentage of school leavers' employment included: Managers and Administrators; Education Professions; Other Professions; Literary, Artistic and Sports Occupations; Engineers and Scientists; and, Supervisors and Foremen. Together these six occupational categories never accounted for more than 3.2% (in 1981) of school leavers' total employment. Two factors were probably responsible for school leavers' under-representation in the above occupational categories: firstly, their limited time in the labour market and the fact that they were, therefore, still at the bottom of occupational ladders, and, secondly, their lack

of age-related, advanced educational, professional and vocational qualifications.

Other studies of young peoples' occupational distribution of employment (Jolly *et al*, 1980; Ashton *et al*, 1982; Hunt and Small, 1983; and, Lee and Wrench, 1983) have all found a similar pattern of occupational concentration. The studies discovered that young people tend to be recruited into occupations where a period of initial vocational training is required because they are relatively cheap to employ and adaptable. Young people were generally not recruited into occupations where age-related educational, vocational and professional qualifications were required; and into occupations where legal minimum age restrictions were important.

Over the period 1977-83, certain occupational categories noticeably increased their relative shares of school leavers' total employment. These included: Health Professions etc; Clerical Occupations etc., and, Other Transferable Craftsmen. In the case of Health Professions etc., this reflected the relative stability of female school leavers' absolute employment in nursing during a period in which their total employment nearly halved. In the case of Clerical Occupations etc. it reflected the relative stability of both genders' absolute employment. Finally, in the case of Other Transferable Craftsmen, it mainly reflected the relative stability of male school leavers' employment in the construction industry.

The occupational categories which saw their relative shares of school leavers' total employment noticeably decline over the period 1977-83 included: Technicians, Draughtsmen etc; Non-Transferable Craftsmen; Skilled Operatives, and, Other Occupations. For all four occupational categories this mainly reflected the decline in school leavers' employment in the manufacturing industries.

3.2.4. Females

Table 3.6 shows the percentage of female school leavers' total employment in each of the WOC's in each of the survey years, their rank and the unweighted N's relating to each survey. It can be seen from that table that female school leavers' employment was highly concentrated. Two occupational categories: Clerical Occupations etc., and, Sales Occupations accounted for over half of female school leavers' employment in each survey year. These two occupational categories increased their combined share of female school leavers' total employment from 52%, in 1977, to 57%, in 1983. Other occupational categories which accounted for a sizeable share of female school leavers' total employment included: Non-Transferable Craftsmen (mainly textile workers); Personal Service Occupations, Other Operatives (semi and unskilled jobs in manufacturing), and, Health Professions etc. (entirely nurses). The remaining occupational categories, i.e. WOC's 1, 2, 4, 5, 6, 7, 10, 11, 12, 14, 16 and 18, were of very minor importance as employers of female school leavers. Their combined share of female school leavers' total employment never exceeded 7.3% (1979) over the period 1977-83.

The occupational categories which noticeably increased their shares of female school leavers' employment over the period 1977-83 were: Health Professions etc; and Clerical Occupations etc. These two categories were discussed above. The occupational categories which noticeably decreased their shares of female school leavers' total employment over the period 1977-83 were: Non-Transferable Craftsmen, and, Other Operatives. The decline in the relative importance of these two occupational categories reflected the greater than average proportionate decline in female school leavers' employment in the manufacturing industries, especially the textile related industries, over this period.

Table 3.6

The occupational distributional distribution of Scottish school leavers' employment, Females, with rank, 1977, 1979, 1981 and 1983

Occupational Category	%				Rank			
	1977	1979	1981	1983	1977	1979	1981	1983
Managers and administrators	0.9	0.7	0.5	0.3	9	10	11	13
Education professions	0.0	0.1	0.2	0.1	16	15	14	16
Health professions etc	4.8	4.8	8.0	10.9	6	6	4	4
Other professions	0.1	0.3	0.3	0.3	15	13	12	13
Literary, artistic and sports occupations	0.7	0.7	0.7	0.4	12	10	10	11
Engineers, scientists etc	0.0	0.1	0.1	0.5	16	15	17	10
Technicians, draughtsmen	1.0	1.5	1.6	1.0	8	8	8	8
Clerical occupations etc	36.7	38.9	41.7	43.5	1	1	1	1
Sales occupations	14.9	18.0	16.6	13.9	3	2	2	2
Supervisors, foremen	0.0	0.0	0.0	0.0	16	17	17	18
Engineering craftsmen	0.9	0.7	0.9	0.8	9	10	4	4
Other transferable craftsmen	0.2	0.0	0.0	0.1	14	17	16	16
Non-transferable craftsmen	16.0	11.3	7.5	7.3	2	3	5	5
Skilled operatives	1.4	1.9	2.0	1.6	7	7	7	7
Other operatives	10.7	11.1	7.1	7.3	4	4	6	5
Security occupations	0.7	0.3	0.3	0.4	12	13	12	11
Personal service occupations	10.1	8.7	12.2	11.5	5	5	3	3
Other occupations	0.9	1.0	0.2	0.3	9	9	14	13
Unweighted N's	2041	2100	3889	787	-	-	-	-

Source: SEDA

Table 3.7 shows the index of dis-similarity figures for each gender separately. Table 3.8 shows the correlation coefficients for the two gender's occupational distributions of employment in each of the survey years. From the figures given in Table 3.7 it can be seen that female school leavers' occupational distribution of employment changed between each survey, with the biggest changes occurring between 1979 and 1981. The correlation coefficients shown in the final column of Table 3.8 indicate that these changes were uni-directional, with the correlation coefficients decreasing in value after 1979.

Table 3.9 shows the Gini coefficient for female school leavers' occupational distribution of employment in each of the survey years. The method by which the Gini coefficients were calculated is described in Appendix 2.3. Note that the closer the Gini coefficient is to one, the more concentrated was a group's occupational distribution of employment. The Gini coefficients shown in Table 3.9 indicate that female school leavers' occupational distribution of employment was initially highly concentrated and grew more concentrated between 1977 and 1981, but became no more concentrated after 1981.

3.2.5. Males

Table 3.10 shows the percentage of male school leavers' total employment accounted for by each of the eighteen WOC's, their rank and the unweighted N's for each of the survey years. From Table 3.10 it can be seen that the largest individual occupational categories for male school leavers were: Engineering Craftsmen (mainly apprentices), Other Operatives (mainly labourers), and, Other Transferable Craftsmen (mainly construction workers). Between them these occupational categories accounted for over half of male school leavers' employment in each of the survey years. In 1977, they accounted for 57% of male school leavers' total employment and by 1983 they accounted for

Table 3.7

The index of dis-similarity between each survey, males and females

	Index	
	Males	Females
1977-79	0.8	0.8
1979-81	0.9	1.1
1981-83	0.9	0.6
1977-83	1.3	1.7

Table 3.8

The correlation coefficients between male and female school leavers' occupational distributions of employment 1977, 1979, 1981 and 1983

Sex	Year	1977		1979		1981		1983	
		M	F	M	F	M	F	M	F
Males	1977	1.000	0.136	0.987	0.137	0.988	0.075	0.973	0.069
Females	1977		1.000	0.167	0.988	0.135	0.964	0.203	0.954
Males	1979			1.000	0.177	0.986	0.123	0.967	0.121
Females	1979				1.000	0.144	0.982	0.213	0.970
Males	1981					1.000	0.091	0.990	0.088
Females	1981						1.000	0.162	0.995
Males	1983							1.000	0.159
Females	1983								1.000

Table 3.9

Gini Coefficients by sex, 1977-83

	1977	1979	1981	1983
Males	0.596	0.592	0.594	0.646
Females	0.720	0.729	0.738	0.738
Both Sexes	0.572	0.577	0.567	0.605

Table 3.10

The occupational distribution of Scottish school leavers' employment, males, with rank, 1977, 1979, 1981 and 1983

Occupational Category	%				Rank			
	1977	1979	1981	1983	1977	1979	1981	1983
Managers and administrators	1.5	1.3	1.8	0.7	12	12	12	15
Education professions	0.2	0.0	0.0	0.0	17	17	17	17
Health professions etc	0.4	0.2	0.5	0.9	15	16	15	13
Other professions	0.4	0.5	0.5	0.1	15	15	15	16
Literary, artistic and sports occupations	0.7	0.6	1.2	1.2	13	14	13	12
Engineers, scientists etc	0.5	1.3	1.0	0.8	14	12	14	14
Technicians, draughtsmen	4.4	4.4	2.9	1.4	9	8	10	11
Clerical occupations etc	7.3	9.3	8.2	10.2	4	3	4	4
Sales occupations	4.5	5.3	4.7	5.4	7	6	7	5
Supervisors, foremen	0.0	0.0	0.0	0.0	18	17	17	17
Engineering craftsmen	27.4	28.0	26.4	27.2	1	1	1	1
Other transferable craftsmen	9.3	9.1	11.3	13.6	3	4	3	3
Non-transferable craftsmen	5.1	3.4	2.7	2.6	6	10	11	9
Skilled operatives	6.8	5.1	5.1	4.0	5	7	6	7
Other operatives	20.6	18.3	20.1	22.1	2	2	2	2
Security occupations	4.5	4.1	6.2	4.5	7	9	5	6
Personal service occupations	2.8	2.9	3.2	3.3	11	11	9	8
Other occupations	3.5	6.2	4.2	1.9	10	5	8	10
Unweighted N's	2203	2073	3616	920	-	-	-	-

fully 63% of male school leavers' total employment. Other relatively important occupational categories included: Clerical Occupations etc; Sales Occupations and Skilled Operatives. The occupational categories which accounted for a particularly small share of male school leavers' total employment were: Managers and Administrators; Education Professions; Health Professions etc; Literary, Artistic and Sports Occupations; Engineers, Scientists etc., and, Supervisors and Foremen. These occupational categories were discussed above. By comparing tables 3.6 and 3.10 it can be seen that male school leavers' occupational distribution of employment was obviously less concentrated than female school leavers'.

The occupational categories which noticeably increased in relative importance over the period 1977–83 included: Clerical Occupations etc., and, Other Transferable Craftsmen. The reason for their relative increase in importance was a smaller than average proportionate reduction in male school leavers' absolute employment. Occupational categories which noticeably declined in relative importance over the period included: Technicians, Draughtsmen; Non-Transferable Craftsmen; Skilled Operatives, and, Other Occupations. These are mainly manufacturing occupations; and their relative decline probably mirrors the decline in the manufacturing industries' fortunes.

Tables 3.7 and 3.8 show the index of dis-similarity and the correlation coefficients respectively, for male school leavers' occupational distributions of employment in 1977, 1979, 1981 and 1983. The index of dis-similarity figures show that male school leavers' occupational distribution of employment changed between each survey, and that the process of change was accelerating. The correlation coefficients show that this process of change was not uni-directional. In fact, the 1983 and 1977 occupational distributions were more highly correlated than the 1983 and 1979 occupational distributions;

however, after 1979, the changes in male school leavers' occupational distribution were uni-directional.

Finally, the Gini coefficients (which measure the concentration of a group's employment into a few occupational categories) for male school leavers' occupational distributions of employment, shown in Table 3.9, indicate that the occupational distribution of male school leavers' employment grew less concentrated between 1977 and 1979, but grew more concentrated after 1979. Overall, male school leavers' occupational distribution of employment was more concentrated in 1983 than in 1977. It can be seen from comparing the Gini coefficients for male and female school leavers' occupational distributions of employment that male school leavers' occupational distribution of employment was always less concentrated than female school leavers'.

3.2.6. The Two Gender's Occupational Distributions of Employment Compared

Table 3.11 shows the percentage of school leavers' total, both genders combined, employment accounted for by either gender in each occupational category, in 1977, 1979, 1981 and 1983. Table 3.12 shows the occupational categories in which female school leavers' share of employment exceeded their share of school leavers' total employment, the occupational categories being ranked according to the magnitude of the percentage differential between female school leavers' share of that occupational category's employment and their share of school leavers' total employment, in each of the survey years. It can be seen from Tables 3.11 and 3.12, that female school leavers had a greater than average share of school leavers' employment (i.e. greater than their share of total school leaver employment) in the following occupational categories: Health Professions etc; Clerical Occupations etc; Personal Service Occupations; Education Professions (latterly); Sales Occupations, and, Non-Transferable Craftsmen. The occupational categories in which males had

Table 3.11

The sex composition of school leavers' employment in the 18 occupational categories, 1977, 1979, 1981 and 1983

Occupational Category	1977		1979		1981		1983	
	M	F	M	F	M	F	M	F
Managers and administrators	66.0	34.0	68.8	31.2	78.6	21.4	77.8	22.2
Education professions	82.7	17.3	0.0	100.0	19.9	80.1	0.0	100.0
Health professions etc	9.7	90.3	3.8	96.2	6.6	93.4	9.4	90.6
Other professions	81.0	19.0	64.8	35.2	65.7	34.3	33.3	66.7
Literary, artistic and sports occupations	53.4	46.6	51.1	48.9	62.4	37.6	78.6	21.4
Engineers, scientists etc	100.0	0.0	96.0	4.0	90.4	9.6	66.7	33.3
Technicians, draughtsmen	83.7	16.3	77.2	22.8	65.6	34.4	61.9	38.1
Clerical occupations etc	18.6	81.4	21.2	78.8	17.1	82.9	21.8	78.2
Sales occupations	25.8	74.2	25.0	75.0	22.9	77.1	31.5	68.5
Supervisors, foremen		-	-	-	-	-	-	-
Engineering craftsmen	97.2	2.8	97.8	2.2	97.0	3.0	97.7	2.3
Other transferable craftsmen	98.5	1.5	100.0	0.0	99.6	0.4	99.2	0.8
Non-transferable craftsmen	26.7	73.3	25.2	74.8	27.6	72.4	30.1	69.9
Skilled operatives	84.5	15.5	75.6	24.4	72.9	27.1	74.5	25.5
Other operatives	69.0	31.0	65.1	34.9	74.8	25.2	78.4	21.6
Security occupations	87.7	12.3	93.0	7.0	95.4	4.6	93.5	6.5
Personal service occupations	24.5	75.5	27.5	72.5	21.9	78.1	25.2	74.8
Other occupations	81.8	18.2	87.1	12.9	95.0	5.0	90.0	10.0
All Occupations	53.5	46.5	53.1	46.9	51.3	48.7	54.3	45.7

Source: SEDA.

Table 3.12

Occupational categories in which females' share of employment exceeded their share of total employment(1)(2)

1977	1979	1981	1983
1. Health Professions etc. (3)	1. Education Professions (2)	1. Health Professions etc. (3)	1. Education Professions (2)
2. Clerical Occupations etc. (8)	2. Health Professions(3)	2. Clerical Occupations etc. (8)	2. Health Professions etc. (3)
3. Personal Service Occupations (17)	3. Clerical Occupations etc. (8)	3. Education Professions (2)	3. Clerical Occupations (8)
4. Sales Occupations(9)	4. Sales Occupations(9)	4. Personal Service Occupations (17)	4. Personal Service Occupations (17)
5. Non-Transferable Craftsmen (13)	5. Non-Transferable Craftsmen (13)	5. Sales Occupations(9)	5. Non-Transferable Craftsmen (13)
6. Literary, Artistic and Sports Occupations(5)	6. Personal Service Occupations (17)	6. Non-Transferable Craftsmen (13)	6. Sales Occupations (9)
	7. Literary, Artistic and Sports Occupations (5)		

Notes: (1) The occupational categories are listed with those with the largest excess, in terms of females' share of employment in them compared to the total employment, first.

(2) The numbers in brackets refer to the numbers of the WOC's.

a greater than average share of employment were: Managers and Administrators; Other Professions; Engineers, Scientists etc; Technicians, Draughtsmen; Engineering Craftsmen; Other Transferable Craftsmen; Skilled Operatives; Other Operatives; (formerly) Education Professions, and, (latterly) Literary, Artistic and Sports Occupations. The general pattern, therefore, was for female school leavers to be over-represented (compared to their share of total employment) in white collar jobs and for male school leavers to be over-represented in manual jobs. This is, of course, the same pattern as that displayed by all ages' employment (see sub-section 3.1.2 above).

3.2.7. Gender Segregation

It is now time to consider the occupational gender segregation of school leavers' employment. The measures to be utilised here are: the index of dis-similarity, the Duncan-Duncan (1955) index of gender segregation, Blau and Hendrick's (1979) decomposition of changes in the Duncan-Duncan index, Hakim's (1979) measures of each gender's over and under-representation in certain occupational categories and Hakim's (1981) measure of horizontal segregation. All these measures are discussed in detail in Appendix 3.2.

The aim in applying these measures to the data for Scottish school leavers is to see if female school leavers, like female all ages, only had access to a limited range of occupations. If they did, this would be particularly serious since it would imply that females' choice of occupation was constrained from the moment of their labour market entry, by such things factors as the careers advice they are given, demand side barriers and their own choices. A study of the barriers faced by young females in attempting to enter traditionally male-dominated occupations (Bennet and Carter, 1982) found that such barriers still exist and range from the gender-stereotyped information provided by Careers Officers to employers' refusal to consider young females for vacancies

in male-dominated occupations.

Table 3.13 shows the index of dis-similarity between each gender's occupational distribution of employment in each of the survey years. The figures in that table show that over the period 1977-83 as a whole the two distributions of employment grew less similar, however, there was not a unidirectional trend. Between 1977 and 1979, the two distributions became more similar, between 1979 and 1981 less similar, and, finally, between 1981 and 1983 more similar again. The same pattern is displayed by the correlation coefficients shown in Table 3.8.

Table 3.14 shows the value of the Duncan-Duncan index of gender segregation for each survey year. This measure of gender segregation is one used in the literature in the United States (Blau and Hendricks, 1979; Beller, 1985) and is easily calculated, since it is none other than a Gini coefficient (different from the one utilised above in that this coefficient compares the concentration of a group's employment relative to another group). The Duncan-Duncan index is equal to (n/2) times the index of dis-similarity, and therefore displays the same pattern over time as the index of dis-similarity. One feature unique to the Duncan-Duncan index, however, is that its value shows the percentage of either gender's employment that would have to have been re-allocated between occupational categories in order to eliminate the gender segregation of school leavers' employment. It can be seen from Table 3.14 that, in each survey year, over 60% of either gender's employment would have to have been so re-allocated in order to eliminate gender segregation.

Blau and Hendricks (1979) provide a method for decomposing the changes in the Duncan-Duncan index into three components. (This decomposition is discussed in detail in Appendix 3.2.) The first component, the "mix effect",

Table 3.13

The index of dis-similarity between female and male school leavers' occupational distributions of employment, 1977, 1979, 1981 and 1983

		Index
Females/Males	1977	6.93
Females/Males	1979	6.75
Females/Males	1981	7.44
Females/Males	1983	7.21

Table 3.14

The Duncan-Duncan Index of occupational segregation for Scottish school leavers in 1977, 1979, 1981 and 1983

	Index
1977	62.35
1979	60.75
1981	66.95
1983	64.85

Table 3.13

The index of dis-similarity between female and male school leavers' occupational distributions of employment, 1977, 1979, 1981 and 1983

		Index
Females/Males	1977	6.93
Females/Males	1979	6.75
Females/Males	1981	7.44
Females/Males	1983	7.21

Table 3.14

The Duncan-Duncan Index of occupational segregation for Scottish school leavers in 1977, 1979, 1981 and 1983

	Index
1977	62.35
1979	60.75
1981	66.95
1983	64.85

relates to the changes in the Duncan-Duncan index caused by the greater than, or less than average, growth of employment in occupational categories in which one gender had a greater than average share of employment, i.e. in which one gender's share of school leavers' employment in that occupational category exceeded their share of school leavers' total employment. The second component, the "composition" effect, relates to the change in the Duncan-Duncan index caused by the changes in the gender composition of employment within occupational categories. The final component, the "interaction effect", results from the interaction of the first two components. This decomposition allows one to determine whether the changes in gender segregation, measured by the changes in the Duncan-Duncan index, resulted from increasing gender segregation within occupations, changes in the occupational structure, or, the joint result of both.

Table 3.15 shows the decomposition of the changes in the Duncan-Duncan index into the three components and it can be seen from that table that the largest component of the changes in the Duncan-Duncan index between each survey was the composition effect. However, this effect tended to be rather erratic moving first one way then the other. Over the entire period 1977-83, the mix effect was the most important component, the reason being that it consistently moved in the same direction in each sub-period, i.e. towards greater segregation. The increase in gender segregation disclosed by the changes in the Duncan-Duncan index was, therefore, mainly due to changes in the occupational distribution of school leavers' employment. It seems most likely that the mix effect owes its origin to the shift in female school leavers' employment away from occupations in which their employment was initially under-represented relative to males'. (See below).

Table 3.16 shows Hakim's (1979) measures of female school leavers' overall

Table 3.15

The decomposition of the changes in the Duncan-Duncan Index of segregation into those parts due to change in the occupational distribution of total employment, the sexual composition of employment within occupational categories and the interaction between them

Period	Change in Duncan-Duncan Index	Mix Effect	Composition Effect	Interaction Effect
1977-79	-1.60	+0.87	-2.94	+0.47
1979-81	+6.20	+0.99	+5.20	+0.01
1981-83	-2.10	+1.45	-3.92	+0.37
1977-83	+2.50	+3.31	-1.66	+0.85

Table 3.16

The degree of female school leavers' over-representation in typically feminine occupations and the degree of their under-representation in typically male occupations, 1977, 1979, 1981 and 1983 (1)(2)

	1977	1979	1981	1983
(1) The Degree of Female Over-Representation in Typically Feminine Occupations	1.67	1.65	1.66	1.67
(2) The Degree of Female Under-Representation in Typically Male Occupations	0.33	0.35	0.29	0.26
(3) (1) - (2)	1.34	1.30	1.37	1.41

(1) The first two indices of segregation reported here are those utilised by Hakim (1979), p21, Table 14, p26 and Table 15 p27.

(2) The third index of segregation is that reported in Hakim (1981) p523. It tends toward zero as segregation declines.

over-representation in occupational categories in which they had a greater than average share of school leavers' employment, and, under-representation in occupational categories in which male school leavers had a greater than average share of school leavers' employment. The over-representation measure is calculated by summing the percentages of female school leavers' total, i.e. all occupations, employment accounted for by the occupations in which they were over-represented and dividing the resulting summed percentage by the equivalent summed percentage for total (both genders combined) school leavers' employment. The under-representation measure is calculated in an analogous manner. The occupational categories in which females had a greater than average share of school leavers' employment are listed in Table 3.12; the occupational categories in which male school leavers had a greater than average share of employment are those not mentioned in Table 3.12.

Table 3.16 also contains a measure of the difference between the measures of female school leavers' over and under-representation. This is the measure of occupational gender segregation proposed and employed in Hakim (1981). Its value will tend towards zero as occupational segregation is eliminated. Hakim's (1979, 1981) measures are designed to measure the extent to which females were "crowded into" certain occupations (Pike, 1982) or excluded from certain other occupations. They therefore give an indication of the extent to which a given level of gender segregation at the aggregate level was the result of extreme segregation in particular occupations.

It can be seen from Table 3.16 that the measure of female school leavers' over-representation in typically feminine occupational categories, hardly changed in value at all between 1977 and 1983. The measure of their under-representation in typically masculine occupations tended to increase in

value after 1979. Hakim's (1981) third measure, i.e. the difference between the measures of female school leavers' over and under-representation, increased from 1.34 in 1977 to 1.41 in 1983, indicating an increase in horizontal segregation, over the period 1977-83 as a whole.

Table 3.17 shows a measure of gender segregation taken from Theil (1972). It measures the extent to which the gender division of school leavers' employment within occupational categories differed from the gender division of school leavers' total (all occupations) employment. The measure is calculated as the difference between a measure of the gender division of school leavers' total employment and a weighted average measure of the gender division of school leavers' employment within occupational categories. The measure ranges in value from zero (school leavers' employment within all the occupational categories was divided in the same proportions as school leavers' total employment, i.e. no gender segregation) to one (male and female school leavers were never found in the same occupational categories, i.e. complete gender segregation). The main advantage of this measure is that it not only takes into account how segregated school leavers' employment was within occupational categories, but also takes into account the relative importance of each occupational category in school leavers' employment, via the weighting by the share of that occupational category in school leavers' total employment. This process of weighting accords with the intuitive notion that a given degree of gender segregation is "more important" in a relatively large occupational category.

It can be seen from Table 3.17 that Theil's measure, shown in row (4), indicates that the gender segregation of school leavers' employment increased between 1977 and 1981 and then decreased between 1981 and 1983. The measure indicates that school leavers' gender segregation increased over the

Table 3.17

Theil's (1972) measure of relative gender segregation, 1977, 1979, 1981 and 1983

Values	1977	1979	1981	1983
1	0.996	0.997	1.000	0.995
2	0.641	0.640	0.592	0.612
3	0.355	0.357	0.407	0.383
4	0.356	0.358	0.407	0.385

Key: The values are defined as:

(1) The entropy of each sex's share of total all occupations employment.

(2) The average value of the entropy of each sex's share of employment in each occupational category.

(3) The difference between 1 and 2.

(4) 3 divided by 1 (= Theil's measure).
Note that the first three values are expressed in bits (binary digits).

period 1977 to 1983 as a whole.

3.2.8. Summary

In this section, it was discovered that a large proportion of school leavers' employment was concentrated into just a few occupational categories. In part, this reflected deficiencies in the official classification of occupations which underlie the Warwick Occupational Classification. However, it also undoubtedly reflected the fact that certain occupations are closed to school leavers by virtue of their youth, e.g. professional and supervisory occupations, and others are youth intensive, e.g. clerical occupations.

The pattern of the division of occupations into those dominated by males and those dominated by females for school leavers was similar to that for all ages. That is, males tended to predominate in manual occupations and females in non-manual, i.e. clerical and personal service occupations. Vertical gender segregation, i.e. males filling the more senior and skilled occupations, was not as apparent among school leavers as among all ages, since school leavers (of either gender) had had little opportunity to progress up occupational ladders.

Another similarity with all ages, was the shift in female school leavers' employment away from manual to non-manual occupations. This probably, in large part, reflected the large decline in female school leavers' manual employment, occasioned by the decline in manufacturing employment, and the smaller decline in service employment, rather than an increase in employment in non-manual occupations. Male school leavers' occupational distribution of employment was remarkably constant between 1977 and 1983.

Finally, it appears that there was an increase in the horizontal segregation of school leavers' employment over the period 1977 to 1983 as a whole. The decomposition of the Duncan-Duncan index, suggested by Blau and Hendricks

(1979), indicated that this was in large part due to a change in the occupational structure of school leavers' employment. It appears from Hakim's measure that female school leavers' under-representation in male-dominated occupational categories increased between 1977 and 1983. The measures differed according to the precise temporal pattern of this increase in horizontal segregation, but this is hardly surprising given the differences in the conception of gender segregation underlying the measures.

3.3. The Occupational Pattern of the Absolute Change in School Leavers' Employment, 1977-83

3.3.1. Introduction

The aim in this section is to examine the occupational pattern of school leavers' job gains, job losses and net employment change over the period 1977-83. However, before the analysis could be undertaken the sample estimates derived from the SEDA had to be grossed up in order to provide population estimates. This was done in an analogous manner to that described in Chapter Two, except this time using the figures relating to the occupational distribution of school leavers' employment. The percentage of school leavers in employment in 1977, 1979, 1981 and 1983 is shown in Table 3.18.

To review terms, job gains are here defined as the increase in the number of jobs computed as being held by school leavers in each occupational category at time t, as compared to time t-1. Job losses are defined in an analogous manner. The net change in employment is simply the number of job gains minus the number of job losses. Finally, it should be noted that the absolute number of job gains and losses recorded is not invariant with respect to the number of categories employed. In general, the larger the number of categories employed, the larger the total number of job gains and losses

Table 3.18

The percentage of school leavers in employment, both sexes and each sex separately, 1977, 1979, 1981 and 1983

	% Both Sexes	% Males	% Females
1977	65.3	68.0	62.5
1979	65.9	67.6	64.1
1981	48.2	49.3	47.1
1983	35.5	37.9	33.0

Source: SEDA.

recorded. However, whatever the magnitude of the job gains and losses, summed job gains minus summed job losses should always equal the actual change in school leavers' total employment, though rounding errors may prevent this in practice.

3.3.2. The Analysis for Both Genders Taken Together

Table 3.19 contains the reconstructed figures for both genders' combined school leaver employment in each of the eighteen WOCs in each of the survey years. These figures provide the raw material for the analysis in this sub-section.

Table 3.20 shows school leavers' job gains, job losses, net employment change and the ratio of job gains to losses across occupational categories, between each survey year, and, over the period 1977-83. Since the temporal pattern of school leavers' total job gains, job losses and net change in employment was discussed in some detail in Chapter Two it will not be discussed here.[7] It can be seen from Table 3.20 that the increase in school leavers' employment between 1977 and 1979 resulted from job gains in: Clerical Occupations etc; Sales Occupations, Other Occupations; Engineering Craftsmen; Engineers, Scientists etc; Technicians, Draughtsmen, and, Other Professions, more than offsetting the job losses in all the remaining occupational categories. The heaviest job losses, in this sub-period, occurred in: Non-Transferable Craftsmen; Other Operatives; Skilled Operatives, Security Occupations, and, Personal Service Occupations. Between 1979 and 1981, school leavers only gained jobs in: Health Professions etc; Education Professions; Security Occupations; and, Literary, Artistic and Sports Occupations. The heaviest loss of jobs occurred in: Clerical Occupations etc; Engineering Craftsmen; Other Operatives; Sales Occupations and Non-Transferable Craftsmen. Between 1981 and 1983, school leavers

Table 3.19

Reconstructed school leavers' distributions of employment, both sexes, 1977, 1979, 1981 and 1983

Occupational Category	1977	1979	1981	1983
Managers and administrators	714	614	530	157
Education professions	59	0	44	31
Health professions etc	1487	1413	1856	1730
Other professions	119	246	178	63
Literary, artistic and sports occupations	416	369	398	252
Engineers, scientists etc	178	430	265	220
Technicians, draughtsmen	1666	1843	1017	377
Clerical occupations etc	12493	14249	10829	7989
Sales occupations	5532	6940	4641	2925
Supervisors, foremen	0	0	0	0
Engineering craftsmen	8983	9336	6188	4749
Other transferable craftsmen	3034	2948	2564	2328
Non-transferable craftsmen	6008	4361	2210	1510
Skilled operatives	2558	2211	1591	912
Other operatives	9518	9151	6100	4812
Security occupations	1666	1413	1459	818
Personal service occupations	3688	3439	3359	2202
Other occupations	1368	2334	972	346
Total	59488	61419	44200	31453

Table 3.20

School leavers' job gains, job losses and net employment change in the eighteen occupational categories, both sexes, 1977, 1979, 1981 and 1983

Occupational Category	1977-79	1979-81	1981-83	Job Gains	Job Losses	Net Change	Ratio of Gains to Losses
Managers and administrators	-100	-84	-373	0	557	-557	0.00
Education professions	-59	+44	-13	44	72	-28	0.61
Health professions etc	-75	+444	-126	444	201	+243	2.21
Other professions	+127	-69	-114	127	183	-56	0.69
Literary, artistic & sports occs	-48	+29	-146	29	194	-165	0.15
Engineers, scientists etc	+251	-165	-45	251	210	+41	1.20
Technicians, draughtsmen	+177	-826	-639	177	1465	-1288	0.12
Clerical occupations etc	+1757	-3420	-2840	1757	6260	-4503	0.28
Sales occupations	+1408	-2299	-1716	1408	4015	-2607	0.35
Supervisors, foremen	0	0	0	0	0	0	0.00
Engineering craftsmen	+353	-3148	-1439	353	4587	-4234	0.08
Other transferable craftsmen	-86	-385	-236	0	707	-707	0.00
Non-transferable craftsmen	-1648	-2151	-700	0	4499	-4499	0.00
Skilled operatives	-347	-620	-679	0	1646	-1646	0.00
Other operatives	-367	-3052	-1287	0	4706	-4706	0.00
Security occupations	-253	+46	-641	46	894	-848	0.05
Personal service occupations	-249	-80	-1157	0	1486	-1486	0.00
Other occupations	+966	-1362	-626	966	1988	-1022	0.49
Job Gains	5039	563	0	5602			
Job Losses	3232	17661	12777		33670		
Net Changes	+1807	-17098	-12777			-28068	
Ratio of Gains to Losses	1.56	0.03	0.00				0.17
% of Job Gains 1977-83	90.0	10.0	0.0				
% of Job Losses 1977-83	9.6	52.5	37.9				
% of Net Change 1977-83	-6.4	60.9	45.5				

Table 3.21

The percentage share of the eighteen occupational categories in school leavers' employment in 1977, net change in employment 1977-83 and the ratio of the two, both sexes

Occupational Category	(1) % Share of Employment in 1977	(2) % Share of the Net Change in Employment 1977-83	(3) (2)/(1)
Managers and administrators	1.2	2.0	1.7
Education professions	0.1	0.1	1.0
Health professions etc	2.5	-0.9	-
Other professions	0.2	0.2	1.0
Literary, artistic & sports occs	0.7	0.6	0.8
Engineers, scientists etc	0.3	-0.1	-
Technicians, draughtsmen	2.8	4.6	1.6
Clerical occupations etc	21.0	16.1	0.8
Sales occupations	9.3	9.3	1.0
Supervisors, foremen	-	-	-
Engineering craftsmen	15.1	15.1	1.0
Other transferable craftsmen	5.1	2.5	0.5
Non-transferable craftsmen	10.1	16.0	1.6
Skilled operatives	4.3	5.9	1.4
Other operatives	16.0	16.8	1.0
Security occupations	2.8	3.0	1.1
Personal service occupations	6.2	5.3	0.9
Other occupations	2.3	3.6	1.6
All Occupations	100.0	100.0	-

experienced no job gains. In this sub-period the heaviest job losses occurred in: Clerical Occupations etc; Sales Occupations; Engineering Craftsmen; Other Operatives, and, Personal Service Occupations.

It can be seen from Table 3.20 that school leavers lost jobs in certain occupational categories in each sub-period. These occupational categories included: Managers and Administrators; Other Transferable Craftsmen; Non-Transferable Craftsmen; Skilled Operatives; Other Operatives, and, Personal Service Occupations. The decline in school leavers' employment in Other Transferable Craftsmen reflected the decline of their employment in the manufacturing and construction industries; the decline in Personal Service Occupations reflected the decline in school leavers' employment in certain service industries, e.g. Miscellaneous Services, and, the decline in the other occupational categories reflected the decline in school leavers' employment in the manufacturing industries. School leavers lost jobs from 1979 onwards in all the occupational categories apart from: Education Professions; Health Professions etc; Literary, Artistic and Sports Occupations, and, Security Occupations. Over the period 1977-83 school leavers only gained jobs, net, in two occupational categories: Health Professions etc. and Engineers, Scientists etc. The job gains in Health Professions etc. were accounted for by the growth in female school leavers' employment as nurses. The growth in Engineers, Scientists etc. reflected the growth of male school leavers' employment as electricians, and, electrical and electronic maintenance engineers.

Table 3.21 shows the percentage of school leavers' total employment in each of the eighteen occupational categories in 1977, the percentage of the net change in school leavers' employment between 1977 and 1983 accounted for by each occupational category, and the ratio of these two percentages. This ratio expresses the extent to which the proportionate change in school leavers'

employment in a particular occupational category differed from the all occupations, average proportionate change (as explained in Chapter Two). It can be seen from the second column of Table 3.21 that the largest individual shares of school leavers' net employment decline, between 1977 and 1983, were accounted for by: Other Operatives; Clerical Occupations etc., Non-Transferable Craftsmen; and Engineering Craftsmen. It can be seen from the final column of Table 3.21 that, in the case of Non-Transferable Craftsmen, its large share of school leavers net employment decline was accounted for by both its large relative importance as an employer of school leavers in 1977 and the fact that it saw school leavers' employment decline by a larger than average proportionate amount. In the case of Other Operatives and Clerical Occupations etc., their large shares of school leavers' net employment decline resulted from their large initial relative size, and were to some extent offset by less than average proportionate reductions in school leavers' employment. Finally, in the case of Engineering Craftsmen, school leavers' employment decline was wholly accounted for by its large initial size.

The occupational categories which experienced a greater than average proportionate decline in school leavers' employment over the period 1977-83 included: Managers and Administrators; Technicians, Draughtsmen; Non-Transferable Craftsmen; Skilled Operatives; Security Occupations; and, Other Occupations. With the exceptions of Managers and Administrators and Security Occupations, they are all manufacturing linked occupational categories. Lower than average proportionate reductions in school leavers' employment were experienced in: Literary, Artistic and Sports Occupations; Clerical Occupations etc; Other Transferable Craftsmen, and Personal Service Occupations. These are all service industry related occupations.

3.3.3. Females

The reconstructed figures for female school leavers' employment in each of the occupational categories in each of the survey years are given in Table 3.22 and they provide the basis for the following analysis. Table 3.23 shows female school leavers' job gains, job losses, net employment change and the ratio of job gains to losses across occupational categories, between surveys, and, for the entire period 1977–83.

It can be seen from Table 3.23 that the increase in female school leavers' total employment between 1977 and 1979 resulted from their job gains in: Education Professions, Health Professions etc; Other Professions; Literary, Artistic and Sports Occupations; Engineers, Scientists etc; Technicians, Draughtsmen; Clerical Occupations etc; Sales Occupations; Skilled Operatives; Other Operatives, and, Other Occupations, more than offsetting their job losses in the remaining occupational categories. In this sub-period their biggest job gains were in: Clerical Occupations etc. and Sales Occupations, and, their biggest job losses were in: Non-Transferable Craftsmen.

Between 1979 and 1981, female school leavers gained jobs in: Education Professions, Health Professions etc., and, Personal Service Occupations. However, these job gains were massively overwhelmed by the job losses in the remaining occupational categories. In this sub-period, the majority of female school leavers' job gains were in Health Professions etc. Their biggest job losses were in: Clerical Occupations etc; Other Operatives; Non-Transferable Craftsmen, and, Sales Occupations.

Between 1981 and 1983, female school leavers gained jobs in: Engineers, Scientists, etc., and, Other Transferable Craftsmen. They lost jobs in all the remaining occupational categories and their largest job losses were in: Clerical

Table 3.22

Female school leavers' reconstructed occupational distribution of employment, 1977, 1979, 1981 and 1983

Occupational Category	1977	1979	1981	1983
Managers and administrators	248	202	107	43
Education professions	0	29	43	14
Health professions etc	1325	1387	1716	1565
Other professions	28	87	64	43
Literary, artistic and sports occupations	193	202	150	57
Engineers, scientists etc	0	29	21	72
Technicians, draughtsmen	276	433	343	144
Clerical occupations etc	10130	11239	8948	6244
Sales occupations	4113	5201	3562	1955
Supervisors, foremen	0	0	0	0
Engineering craftsmen	248	202	193	115
Other transferable craftsmen	55	0	0	14
Non-transferable craftsmen	4417	3265	1609	1048
Skilled operatives	386	549	429	230
Other operatives	2954	3207	1524	1048
Security occupations	193	87	64	57
Personal service occupations	2788	2514	2618	1651
Other occupations	248	289	43	43
Total	27602	28892	21458	14343

Table 3.23

Female School Leavers' job gains, job losses and net change in employment in the eighteen occupational categories, 1977-1983

Occupational Category	1977-79	1979-81	1981-83	Job Gains	Job Losses	Net Change	Ratio of Gains to Losses
Managers and administrators	-46	-95	-64	0	205	-205	0.00
Education professions	+29	+14	-29	43	29	+14	1.48
Health professions etc	+62	+330	-152	392	152	+240	2.58
Other professions	+59	-22	-21	59	43	+16	1.37
Literary, artistic & sports occs	+9	-52	-93	9	145	-136	0.06
Engineers, scientists etc	+29	-7	+50	79	7	+72	11.29
Technicians, draughtsmen	+157	-90	-200	157	290	-133	0.54
Clerical occupations etc	+1109	-2291	-2704	1109	4995	-3886	0.22
Sales occupations	+1088	-1639	-1567	1088	3206	-2118	0.34
Supervisors, foremen	0	0	0	0	0	0	0.00
Engineering craftsmen	-46	-9	-78	0	133	-133	0.00
Other transferable craftsmen	-55	0	+14	14	55	-41	0.25
Non-transferable craftsmen	-1152	-1655	-562	0	3369	-3369	0.00
Skilled operatives	+163	-120	-200	163	320	-157	0.51
Other operatives	+253	-1684	-476	253	2160	-1907	0.12
Security occupations	-107	-22	- 7	0	136	-136	0.00
Personal service occupations	-274	+104	-967	104	1241	-1137	0.08
Other occupations	+40	-246	0	40	246	-240	0.16
Job Gains	2998	448	64	3510			
Job Losses	1680	7932	7120		16732		
Net Change	+1318	-7484	-7056			-13222	
Ratio of Gains to Losses	1.78	0.06	0.01				0.21
% Job Gains 1977-83	85.4	12.8	1.8				
% Job Losses 1977-83	10.0	47.4	42.6				
% Net Change 1977-83							

Occupations etc. and Sales Occupations.

It can be seen from Table 3.23 that female school leavers experienced job losses in certain occupational categories in each sub-period. These occupational categories were: Managers and Administrators; Engineering Craftsmen; Non-Transferable Craftsmen, and, Security Occupations. By far the largest job losses were in Non-Transferable Craftsmen and this largely reflected the decline of female school leavers' employment in the Clothing and Footwear, and, Textile industries. Apart from in: Education Professions; Health Professions etc; Engineers, Scientists etc; Other Transferable Craftsmen, and, Personal Service Occupations, female school leavers' employment declined from 1979 onwards. Over the period 1977-83, female school leavers only gained jobs, net, in four occupational categories: Education Professions, Health Professions etc., Other Professions, and, Engineers, Scientists etc. By far the largest number of job gains shown in Table 3.23 was accounted for by an increase in the number of female school leavers becoming nurses.

Table 3.24 shows the shares of female school leavers' total employment in 1977, and of their net change in employment 1977-83, accounted for by each occupational category, and the ratio of the two. It is thus analogous to Table 3.21. It can be seen from the second column of Table 3.24 that the largest shares of female school leavers' employment decline between 1977 and 1983 were accounted for by: Clerical Occupations etc; Non-Transferable Craftsmen; Sales Occupations, and, Other Operatives. Between them these categories accounted for 82% of all jobs lost and 85% of the net change in female school leavers' employment. It can be seen from the final column of Table 3.24 that in the cases of Sales Occupations; Non-Transferable Craftsmen, and, Other Operatives, their large shares of female school leavers' net employment decline resulted from both their large initial relative importance and the fact that

Table 3.24

The percentage share of the eighteen occupational categories in female school leavers' employment in 1977, net change in employment 1977-83 and the ratio of the two

Occupational Category	(1) % Share of Employment in 1977	(2) % Share of the Net Change in Employment 1977-83	(3) (2)/(1)
Managers and administrators	0.9	1.5	1.7
Education professions	0.0	-0.1	-
Health professions etc	4.8	-1.8	-
Other professions	0.1	-0.1	-
Literary, artistic & sports occs	0.7	1.0	1.5
Engineers, scientists etc	0.0	-0.5	-
Technicians, draughtsmen	1.0	1.0	1.0
Clerical occupations etc	36.7	29.3	0.8
Sales occupations	14.9	16.0	1.1
Supervisors, foremen	0.0	0.0	-
Engineering craftsmen	0.9	1.0	1.1
Other transferable craftsmen	0.2	0.3	1.5
Non-transferable craftsmen	16.0	25.4	1.6
Skilled operatives	1.4	1.1	0.8
Other operatives	10.7	14.3	1.3
Security occupations	0.7	1.0	1.5
Personal service occupations	10.1	8.6	0.8
Other occupations	0.9	1.5	1.7
All Occupations	100.0	100.0	-

female school leavers' employment in these categories was reduced by more than the average proportionate amount. In the case of Clerical Occupations etc. its large share of female school leavers' net employment decline was principally accounted for by its large initial size, since, in fact, female school leavers' employment in this category was reduced by less than the average proportionate amount.

The occupational categories which experienced a greater than average, proportionate reduction in female school leavers' employment were: Managers and Administrators; Literary, Artistic and Sports Occupations; Sales Occupations; Engineering Craftsmen; Other Transferable Craftsmen; Non-Transferable Craftsmen; Other Operatives; Security Occupations, and, Other Occupations. The greater than average proportionate reduction in Sales Occupations reflected the decline in female school leavers' employment in retailing (see Ashton and Maguire, 1982; on this trend).. The greater than average proportionate decline in all the other occupational categories, apart from Managers and Administrators and Literary, Artistic and Sports Occupations, probably reflected the decline in female school leavers' employment in the manufacturing industries. Less than average proportionate reductions were experienced in: Clerical Occupations etc; Skilled Operatives, and, Personal Service Occupations. Female school leavers experienced net, entire-period job gains in: Education Professions; Health Professions etc; Other Professions, and, Engineers, Scientists etc. So, female school leavers tended to experience greater than average proportionate reductions in their employment in manual and sales occupations, and less than average proportionate reductions, or even increases in, their employment in white collar occupations, though there were some exceptions to the general pattern.

3.3.4. Males

The reconstructed figures for male school leavers' employment in each of the occupational categories, in each of the survey years, given in Table 3.25, provide the basis for the analysis in this sub-section. Table 3.26 shows male school leavers' job gains, job losses, net employment change and the ratio of job gains to losses across the eighteen occupational categories, between surveys, and for the entire period 1977-83.

It can be seen from Table 3.26 that the increase in male school leavers' total employment between 1977 and 1979 resulted from job gains in: Other Professions; Engineers, Scientists etc; Technicians, Draughtsmen; Clerical Occupations etc; Sales Occupations; Engineering Craftsmen; Personal Service Occupations; and, Other Occupations, outnumbering job losses in the remaining occupational categories. In this sub-period, their largest job gains were in: Other Occupations; Clerical Occupations etc; Engineering Craftsmen and Sales Occupations. Their biggest job losses in this sub-period were in: Other Operatives; Non-Transferable Craftsmen, and, Skilled Operatives.

Between 1979 and 1981, male school leavers only gained jobs in: Health Professions etc; Literary, Artistic and Sports Occupations, and, Security Occupations. They lost jobs in all the remaining occupational categories. Their largest job losses were in: Engineering Craftsmen; Other Operatives; Clerical Occupations etc; and Other Occupations.

Between 1981 and 1983, male school leavers only gained jobs in Health Professions etc. They lost jobs in all the remaining occupational categories, except for Education Professions, where there was no change in their employment. During this sub-period, their biggest losses were in: Engineering Craftsmen (reflecting the decline in traditional apprenticeships); Security

Table 3.25

Male school leavers' reconstructed occupational distributions of employment, 1977, 1979, 1981 and 1983

Occupational Category	1977	1979	1981	1983
Managers and administrators	480	423	409	120
Education professions	64	0	0	0
Health professions etc	128	65	114	154
Other professions	128	163	114	17
Literary, artistic and sports occupations	224	195	273	205
Engineers, scientists etc	160	423	227	137
Technicians, draughtsmen	1407	1431	660	239
Clerical occupations etc	2334	3025	1865	1744
Sales occupations	1439	1724	1069	923
Supervisors, foremen	0	0	0	0
Engineering craftsmen	8761	9108	6004	4651
Other transferable craftsmen	2974	2960	2570	2326
Non-transferable craftsmen	1631	1106	614	445
Skilled operatives	2174	1659	1160	684
Other operatives	6587	5952	4571	3779
Security operations	1439	1334	1410	769
Personal service occupations	895	943	728	564
Other occupations	1119	2017	955	325
Total	31976	32527	22742	17100

Table 3.26

Male school leavers' job gains, job losses and net change in employment in the eighteen occupational categories, 1977-1983

Occupational Category	1977-79	1979-81	1981-83	Job Gains	Job Losses	Net Change	Ratio of Gains to Losses
Managers and administrators	-57	-13	-290	0	360	-360	0.00
Education professions	-64	0	0	0	64	- 64	0.00
Health professions etc	-63	+49	+ 40	89	63	+ 26	1.41
Other professions	+35	-49	- 97	35	146	-111	0.24
Literary, artistic & sports occs	-29	+78	- 68	78	97	- 19	0.80
Engineers, scientists etc	+263	-195	- 91	263	286	- 23	0.92
Technicians, draughtsmen	+24	-772	-420	24	1192	-1168	0.02
Clerical occupations etc	+691	-1160	-121	691	1281	-590	0.54
Sales occupations	+285	-655	-145	285	800	-515	0.36
Supervisors, foremen	0	0	0	0	0	0	0.00
Engineering craftsmen	+346	-3104	-1353	346	4457	-4111	0.08
Other transferable craftsmen	-14	-390	-244	0	648	-648	0.00
Non-transferable craftsmen	-525	-492	-169	0	1186	-1186	0.00
Skilled operatives	-516	-499	-476	0	1491	-1491	0.00
Other operatives	-635	-1381	-792	0	2808	-2808	0.00
Security occupations	-105	+76	-640	76	745	-669	0.10
Personal service occupations	+48	-216	-163	48	379	-331	0.13
Other occupations	+897	-1062	-630	897	1692	-795	0.53
Job Gains	2589	203	40	2832			
Job Losses	2008	9988	5699		17695		
Net Change	+581	-9785	-5659			-14863	
Ratio of Gains to Losses	1.29	0.02	0.01				0.16
% Job Gains 1977-83	91.4	7.2	1.4				
% Job Losses 1977-83	11.3	56.4	32.2				
% Net Change 1977-83	-3.9	65.8	38.1				

Occupations; Other Operatives and Other Occupations, i.e. much the same occupational categories as in the previous sub-period with the exception of Security Occupations, wherein the decline in their employment probably reflected a decline in army recruitment.

From Table 3.26 it can be seen that male school leavers experienced job losses in certain occupational categories in each sub-period. These occupational categories were: Managers and Administrators, Other Transferable Craftsmen; Non-Transferable Craftsmen, Skilled Operatives; and, Other Operatives, i.e. mainly manual, manufacturing based occupations. Apart from in: Health Professions etc; Literary, Artistic and Sports Occupations, and, Security Occupations, male school leavers experienced job losses in all the occupational categories after 1979. Over the period 1977-83 as a whole, male school leavers only experienced a net job gain in Health Professions etc.

Table 3.27 shows the percentage share of the eighteen occupational categories in male school leavers' total employment in 1977, in their net change in employment between 1977 and 1983, and the ratio of the two. It can be seen from the second column of Table 3.27 that the largest shares of male school leavers' net employment decline between 1977 and 1983 were accounted for by: Engineering Craftsmen; Other Operatives; Skilled Operatives; Non-Transferable Craftsmen, and, Technicians, Draughtsmen. Between them these occupational categories accounted for 62.3% of all male school leavers' job losses and 72.3% of male school leavers' net employment decline. So, male school leavers' job losses and net employment decline were less concentrated than those of female school leavers; this difference reflected the greater initial concentration of female school leavers' employment.

It can be seen from the final column of Table 3.27 that in the cases of:

Table 3.27

The percentage share of the eighteeen occupational categories in male school leavers' employment in 1977, net change in employment 1977-83 and the ratio of the two

Occupational Categories	(1) % Share of Employment in 1977	(2) % Share of the Net Change in Employment 1977-83	(3) (2)/(1)
Managers and administrators	1.5	2.4	1.6
Education professions	0.2	0.4	2.0
Health professions etc	0.4	-0.2	-
Other professions	0.4	0.7	1.8
Literary, artistic & sports occs	0.7	0.1	0.1
Engineers, scientists etc	0.5	0.2	0.4
Technicians, draughtsmen	4.4	7.8	1.8
Clerical occupations etc	7.3	4.0	0.5
Sales occupations	4.5	3.5	0.8
Supervisors, foremen	0.0	0.0	-
Engineering craftsmen	27.4	27.6	1.0
Other transferable craftsmen	9.3	4.4	0.5
Non-transferable craftsmen	5.1	8.0	1.6
Skilled operatives	6.8	10.0	1.5
Other operatives	20.6	18.9	0.9
Security occupations	4.5	4.5	1.0
Personal service occupations	2.8	2.2	0.8
Other occupations	3.5	5.3	1.5
All Occupations	100.0	100.0	-

Technicians, Draughtsmen; Non-Transferable Craftsmen, and, Skilled Operatives, their relatively large shares of male school leavers' net employment decline resulted both from their initial size and the fact that male school leavers' employment declined by a greater than average proportionate amount. In the case of Engineering Craftsmen, it mainly reflected its large initial size, since in this occupational category school leavers' employment declined by the average proportionate amount. Finally, in the case of Other Operatives, its large share of male school leavers' net employment decline resulted from its large initial size; since male school leavers' employment declined by less than the average proportionate amount.

The occupational categories in which male school leavers' employment declined by more than the average proportionate amount were: Managers and Administrators; Education Professions; Other Professions; Technicians, Draughtsmen; Non-Transferable Craftsmen; Skilled Operatives, and, Other Occupations. Lower than average proportionate reductions in male school leavers' employment occurred in: Literary, Artistic and Sports Occupations; Engineers, Scientists etc; Clerical Occupations etc; Sales Occupations; Other Transferable Craftsmen; Other Operatives, and, Personal Service Occupations. Male school leavers experienced net, entire period, job gains in Health Professions etc. The overall pattern was for male school leavers to experience greater than average proportionate reductions in their employment in higher status white collar occupations (with the exception of Health Professions etc) and manufacturing based occupations, and, to experience lower than average proportionate reductions in their employment in other non-manual and construction related occupations.

3.3.5. The Gender Composition of School Leavers' Net Employment Change

The aim in this sub-section is to examine the gender and occupational category components of school leavers' net employment change over the period 1977-83, and to that end Table 3.28 shows the percentage of school leavers' net total employment change accounted for by either gender in each occupational category. It can be seen from that table that the largest single sources of school leavers' net change in employment were male school leavers' job losses in Engineering Craftsmen; female job losses in Clerical Occupations etc; female job losses in Non-Transferable Craftsmen, and, male job losses in Other Operatives in that order. Between them these occupational categories accounted for 50% of the total net decline in school leavers' employment over the period 1977-83. Thus, school leavers' job losses were highly concentrated.

In the case of female school leavers' job losses in Non-Transferable Craftsmen, the large number of job losses reflected both its large initial, importance and the fact that it reduced their employment by more than the average proportionate amount. In the case of the other three occupational categories, the large number of job losses solely reflected their initial relative importance as employers of male or female school leavers.

Table 3.29 shows female school leavers' share of school leavers' total employment in each occupational category in 1977, their share of school leavers' net change in employment in each occupational category between 1977 and 1983, and, the ratio of the two. The value of the ratio shows whether the net change in school leavers' employment, within each occupational category, was gender-neutral. A value of one indicates gender-neutrality; a value greater than one indicates that female school leavers accounted for a greater than gender-neutral proportion of school leavers' net change in employment, and, a figure less than one indicates that male school leavers

Table 3.28

The percentage of school leavers' net employment change 1977-83 accounted for by either sex in the 18 occupational categories

Occupational Category	Males	Females
Managers and administrators	1.3	0.8
Education professions	0.2	0.0
Health professions etc	-0.1	-0.9
Other professions	0.4	-0.1
Literary, artistic and sports occupations	0.1	0.5
Engineers, scientists etc	0.1	-0.3
Technicians, draughtsmen	4.2	0.5
Clerical occupations etc	2.1	13.8
Sales occupations	1.8	7.5
Supervisors, foremen	-	-
Engineering craftsmen	14.6	0.5
Other transferable craftsmen	2.3	0.1
Non-transferable craftsmen	4.2	12.0
Skilled operatives	5.3	0.6
Other operatives	10.0	6.8
Security occupations	2.4	0.5
Personal service occupations	1.2	4.0
Other occupations	2.8	0.9
All Occupations	52.9	47.1

Table 3.29

Female school leavers' percentage shares of school leavers' employment in 1977, their share of school leavers' net change in employment 1977-83 and the ratio of the two

Occupational Category	(1) % Share of School Leavers' Employment in 1977	(2) % Share of School Leavers' Net Employment Change 1977-83	(3) (2)/(1)
Managers and administrators	34.0	36.3	1.1
Education professions	17.3	-28.0	-
Health professions etc	90.3	90.2	1.0
Other professions	19.0	-16.8	-
Literary, artistic & sports occs	46.6	87.7	1.9
Engineers, scientists etc	0.0	146.9	-
Technicians, draughtsmen	16.3	10.2	0.6
Clerical occupations etc	81.4	86.8	1.1
Sales occupations	74.2	80.4	1.1
Supervisors, foremen	-	-	-
Engineering craftsmen	2.8	3.1	1.1
Other transferable craftsmen	1.5	6.0	4.0
Non-transferable craftsmen	73.3	74.0	1.0
Skilled operatives	15.5	9.5	0.6
Other operatives	31.0	40.4	1.3
Security occupations	12.3	16.9	1.4
Personal service occupations	75.5	77.5	1.0
Other occupations	18.2	23.2	1.3
All Occupations	46.5	47.1	1.0

Note: Only female school leavers gained jobs in categories 2, 4 and 6. Male and female school leavers shared job gains in category 3.

accounted for a greater than gender-neutral proportion of school leavers' net change in employment. The occupational categories: Education Professions; Health Professions etc. and Engineers, Scientists etc., do not have a value given for their ratio in Table 3.29 because in their cases female school leavers gained jobs whilst male school leavers lost jobs. In the case of Health Professions etc. both male and female school leavers gained jobs, but female school leavers gained the overwhelming majority of those jobs.

From Table 3.29 it can be seen that female school leavers experienced a smaller than gender-neutral share of school leavers' net decline in employment in: Technicians, Draughtsmen, and, Skilled Operatives. Gender-neutral net employment changes took place in: Health Professions etc. (see above); Non-Transferable Craftsmen, and, Personal Service Occupations. Finally, female school leavers accounted for a greater than gender-neutral proportion of school leavers' net decline in employment in: Managers and Administrators; Literary, Artistic and Sports Occupations; Clerical Occupations etc; Sales Occupations; Engineering Craftsmen; Other Transferable Craftsmen; Other Operatives; Security Occupations, and, Other Occupations. Thus, the pattern of school leavers' employment change indicated a tendency toward non-gender-neutrality across occupations.

3.3.6. Summary

Between 1977 and 1983, school leavers' total employment declined by nearly 50% (see Chapter Two). However, this decline in their employment was not evenly spread across occupational categories. School leavers tended to lose the largest number of jobs in manual, sales and clerical occupations. The smallest declines, and the only increases, in school leavers' employment took place in professional and technical occupations. School leavers of both genders only gained jobs, over the period 1977 to 1983, in Health Professions. Female

school leavers alone gained a small number of jobs in: Education Professions; Other Professions; and Engineers, Scientists.

It was the manual occupations as a group, i.e. WOC's 9 to 18, that initiated the decline in school leavers' employment. White collar and sales occupations, i.e. WOC's 1 to 9, only began to contribute, as a group, to school leavers' decline in employment after 1979. Given that the manual occupations tend to be concentrated in the manufacturing industries and that white collar and sales occupations tend to be concentrated in the service industries, the above described pattern of timing is consistent with the pattern described in Chapter Two, i.e. the manufacturing industries initiating the decline in school leavers' employment and the service industries substantially contributing to it after 1979.

Male school leavers lost the majority of their jobs in manufacturing related, particularly engineering related, and other manual occupations. Female school leavers lost the majority of their jobs in clerical, sales and textile and clothing industry related occupations. This pattern of job loss reflected the pre-existing, i.e. existing in 1977, concentrations of male and female school leavers' employment.

3.4. Conclusion

To return to the three themes discussed in the Introduction, and starting with the differences between male and female school leavers' occupational distributions of employment, one of the main conclusions in this Chapter was that the occupational distributions of male and female school leavers' employment, the changes in their occupational distributions of employment and the occupational patterns of their net change in employment were quite different. Therefore, the following discussion considers male and female school

leavers separately.

The main difference between male and female school leavers' occupational distributions of employment in each of the survey years was that female school leavers were much more likely to be found in white collar jobs, (especially clerical jobs), and sales jobs than male school leavers and that male school leavers were much more likely to be found in manual jobs than female school leavers. Thus, the main differences between male and female school leavers' occupational distributions of employment were much the same as those between male and female all ages' occupational distributions of employment; with the important difference that since school leavers start of the bottom of career ladders, there was less vertical segregation in their case.

Another difference between the genders was that there was little change in male school leavers' occupational distribution of employment between 1977 and 1983. This entire-period stability in male school leavers' occupational distribution of employment is quite remarkable when one considers the scale of the decline in their total employment.

Both male and female school leavers' occupational distributions of employment were highly concentrated. In each year, female school leavers' occupational distribution of employment was more concentrated than male school leavers'. To a certain extent, this may have been an artefact of the official classifications of employment, which tend to more finely distinguish between traditionally male occupations, however, the large difference between the values of the Gini coefficients does suggest that female school leavers did, in fact, enter a narrower range of occupations than their male counterparts. Both male and female school leavers' occupational distributions of employment became more concentrated between 1977 and 1983.

It appears that, between 1977 and 1983, the extent of horizontal occupational gender segregation between male and female school leavers' employment increased. This increase took place after 1979. It seems most likely that this was caused by the shift in female school leavers' employment away from male dominated occupational categories (see Table 3.16).

Turning to the second theme mentioned in the Introduction, i.e. the extent to which the trends in school leavers' occupational distributions of employment mirrored those experienced by all ages, female school leavers shared in the shift in all ages' employment away from manual occupations to non-manual occupations. However, this often reflected the fact that school leavers' employment fell by proportionately less in the non-manual occupations that their employment in manual occupations. School leavers did not experience, to anything like the same extent, the increase in employment in professional and technical occupations enjoyed by all ages. This was a result of the fact that such occupations are often closed to school leavers by virtue of their lack of the appropriate qualifications.

Turning to the third theme mentioned in the Introduction, i.e. the extent to which school leavers' decline in employment was concentrated in just a few occupational categories, it was discovered that both male and female school leavers' net employment decline tended to be concentrated in the occupational categories which accounted for the largest shares of their employment in 1977. The largest shares of male school leavers' employment decline, over the period 1977 to 1983, were accounted for by: Engineering Craftsmen; Other Operatives; Skilled Operatives; Non-Transferable Craftsmen, and, Technicians, Draughtsmen. These are all manufacturing (especially metal-bashing) or construction industry related occupational categories. The largest shares of female school leavers' employment decline, over the period 1977 to 1983, were accounted for by:

Clerical Occupations etc; Non-Transferable Craftsmen, and, Sales Occupations.

This concentration of school leavers' net employment decline in manual and less skilled non-manual occupations is consistent with the evidence relating to all ages, reviewed in sub-section 3.1.2 above, and also with the pattern found by Roberts *et al.* (1986) in their study of youth labour markets in Liverpool, Walsall and Chelmsford in 1984 and 1985. To anticipate some of the material in Chapter Six, the difference between Roberts *et al.*'s (1986) findings and those reported here is that, it can be clearly seen here that the concentration of school leavers' net employment decline in such occupations mainly reflected their initial concentration of employment in such occupations. Roberts *et al.* (1986), on the other hand, lacking data on young peoples' occupational distribution of employment in the mid-1970's, took the decline in young peoples' employment in such occupations as a sign of dramatic occupational change (see Chapter Six).

For both male and female school leavers, it was discovered that their employment tended to bear up well, or increase slightly, in professional and technical occupations, as the analysis of all ages' occupational trends, contained in subsection 3.1.2, suggested might be the case. The problem for school leavers was that so few of them were initially employed in such occupations, because of their youth and subsequent lack of age-related vocational and educational qualifications. Consequently, their modest job gains in professional and technical occupations were overwhelmed by their job losses in the manual and less skilled jobs in which their employment was initially concentrated.

Footnotes

1. The discussion in this sub-section is not as detailed as the equivalent sections in the industrial analysis (See Chapters Two and Five); because of two fundamental problems which have limited research in this area. Firstly, a lack of adequate data. The only regular and reliable data collected on the occupational distribution of Scottish all ages' employment is contained in the decennial population censuses. Other official surveys, notably The Labour Force Survey, do collect such information but their sample numbers are too low to produce reliable estimates for Scotland alone. The second problem is the changes in the official classification of occupations over time. In particular, the change from The 1970 Classification of Occupations to The 1980 Classification of Occupations, which entailed a radical alteration in the way in which occupations were classified (Boston, 1980). These two problems mean that it is extremely difficult to create long time series of occupational statistics.

2. "Relatively" here and elsewhere in the text means relative to the other gender or to all ages' employment, depending upon the context.

3. The figures used were those in Kendrick's (1985a) Tables 2M and 2F and Elias' (1985) Tables 3 and 4.

4. This discussion relates to the pre-1985 WOCs. I know of no way to convert the 25 post-1985 WOCs back to the 1970 Classification of Occupations (See Elias (1985) for a discussion of the post-1985 WOCs) so they could not be used here.

5. Since nearly all school leavers are employees anyhow, this is of little concern here.

6. A number of studies (Jolly *et al*, 1980; Hunt and Small, 1981; Markall and Finn, 1981; Lee and Wrench, 1983; Livock, 1983) have found that the need for vocational training or for professional qualifications was a major factor in firm's decisions as to whether or not to hire school leavers, in preference to other labour market groups, for certain jobs. School leavers were generally preferred for jobs which required significant initial vocational training (because of their relative cheapness and their adaptability) and generally barred from jobs which required professional qualifications; which are usually acquired later in life.

7. Due to the fact that the reconstructed figures for school leavers' employment are being viewed from the vantage point of school leavers' occupations of employment, rather than from the vantage point of their industry of employment, the total number of job gains, job losses and the net change in employment between each sub-period may not be the same as those given in Section 2.5 of Chapter Two. The net change in school leavers' total employment between sub-periods should be the same in theory, but rounding errors prevent this occurring in practice.

CHAPTER 4

THE PROXIMATE SOURCES OF THE CHANGES IN SCOTTISH SCHOOL LEAVERS' OCCUPATIONAL DISTRIBUTION OF EMPLOYMENT, 1977-83

4.1. Introduction

4.1.1. Preface

The aim in this short Chapter is to pull together the discussion of the changes in Scottish school leavers' industrial and occupational distributions of employment contained in the previous two chapters by examining the extent to which the changes in school leavers' occupational distribution of employment resulted from changes in their industrial distribution of employment. In fact, the change in any group's occupational distribution of employment can be divided into three parts: firstly, that part due to changes in the industrial distribution of their employment, secondly, that part due to changes in their occupational distribution of employment *within* industries, and, finally, that part due to the joint effect of the two sets of changes. The intention in this Chapter is to apply a shift-share technique for decomposing the changes in an occupational distribution of employment into the three parts discussed above to the data for Scottish school leavers' employment.

The actual shift-share technique used to perform this decomposition is the one used by Joachim Singelmann and colleagues (Singelmann and Browning, 1980; Wright and Singelmann, 1982). Singelmann and colleagues term the first part of the change in a group's occupational distribution of employment "The Occupational Composition Shift Effect", the second part "The Industry Shift Effect", and the final part "The Interaction Effect". The actual procedure used to achieve the decomposition is fully described in Appendix 4.1. Only a brief

discussion of the technique is provided below.

British examples of similar shift-share decompositions of the changes in all ages' occupational distributions of employment, or, their occupational pattern of employment change include: Jones (1977), Whitley *et al.* (1980), Elias (1985), Kendrick (1985b) and Elias and Wilson (1986). The studies by Elias (1985), Kendrick (1985b) and Elias and Wilson (1986) indicate that all ages' employment in many manual occupations has declined as a result of both adverse industrial shifts and adverse occupational shifts within industries, whereas non-manual employment has increased as a result of positive industrial shifts offsetting negative occupational shifts within industries for lower level non-manual occupations, e.g. clerical workers, and positive occupational shifts within industries augmenting positive industry shifts in the case of professional and technical occupations.

4.1.2. The Shift-Share Technique Examined

In explaining the shift-share technique it is useful to consider a hypothetical example. Suppose it is observed that between 1977 and 1983, the share of school leavers' total employment accounted for by the occupational category Clerical Occupations etc had increased. The question then is, why has it increased? It might be that within each industrial category a greater proportion of school leavers' employment had come to be accounted for by clerical occupations. That is, the increase in the share of Clerical Occupations etc in school leavers' total employment might have been due to a change in the occupational composition of school leavers' employment within industries, i.e. the occupational composition shift effect. However, it may be that the occupational composition of school leavers' employment within industries had remained unchanged, but, that those industrial categories which contained a high proportion of clerical workers had increased their shares of school leavers'

total employment. That is, the increase in the share of Clerical Occupations etc in school leavers' total employment might have been due to a change in the industrial distribution of school leavers' employment, i.e. the industry shift effect.

In practice, the observed change in school leavers' occupational distribution of employment is likely to have been caused by changes in the occupational composition of their employment within industries, changes in the shares of individual industries in school leavers' total employment, and, the interaction of these two sets of changes. It is also likely that the relative importance of these three effects will have varied between occupational categories.

The shift-share technique operates in the following manner. One starts by obtaining occupation by industry matrices for 1977 and 1983. The entries in the cells of these occupation by industry matrices show the percentage of school leavers' employment within each industry accounted for by each occupational category. One then multiplies the figures relating to the proportion of school leavers' total employment accounted for by each industrial category in each of the two years, i.e. the industrial marginals to the occupation by industry matrix, by the figure for school leavers' total employment in 1983. One then uses the entries in the occupation by industry matrix to calculate how many school leavers would have been employed in each occupational category in each industry, in each of the two years, then, by summing the resulting figures for each occupational category across industrial categories, one can calculate the number of school leavers who would have been found in each occupational category. One then subtracts the resulting figures for 1977 from the figures for 1983 to obtain the "net shift" in school leavers' employment in each occupational category.

The net shift in school leavers' employment in each occupational category shows the change in their employment brought about by changes in the occupational distribution of their employment, abstracting from the change in the level of their total employment. It is this net shift which is then decomposed into the occupational composition shift, the industry shift and the interaction effects.

The occupational composition shift effect is calculated by fixing the industry marginal to the occupation by industry matrix at its 1977 configuration and multiplying the figures relating to the proportion of school leavers' total employment accounted for by each industrial category by the figure for school leavers' total employment in 1983. Then, using the entries in the occupation by industry matrix for 1983, one calculates how many school leavers would have been found in each occupational category in each industry. Summing the resulting figures for each occupational category across all the industrial categories and subtracting the figures for school leavers' employment estimated using the 1977 occupation by industry matrix gives the occupational composition shift effect. The industry shift effect is calculated in a similar manner but this time using only 1977's occupation by industry matrix and only allowing the industrial distribution of school leavers' employment to change. The interaction effect is calculated by subtracting each occupational category's occupational composition and industry shift effects from their net shift. A more detailed account of the mechanics of the shift-share technique is contained in Appendix 4.1.

4.1.3. Some Caveats

Before the results of applying the shift-share technique to the data for school leavers' employment for 1977 and 1983 are presented, three problems must be mentioned. The first problem relates to the nature of the school

leaver data. Since the data was derived from a sample survey, the estimates utilised here will have been affected by sampling variation. Given the small number of school leavers in each of the cells in the occupation by industry matrices utilised in the technique, it is likely that a considerable amount of "noise" will have been introduced into the calculations by sampling variation. The second problem relates to the fact that the estimates for 1983 were based on a lower sample size than those for 1977. In fact, the number of sampled school leavers in the labour market in 1977 outnumbered the equivalent number for 1983 by nearly 2.5 to one[1]. This meant that the cell numbers were, on average, lower in 1983 and, also, that there were more empty cells in 1983. The final problem relates to the recoding of school leaver's occupation and industry of employment in order to bridge over the changes, between 1977 and 1983, in the official occupational and industrial classification schemas (and hence the classification schemas used in the Scottish Education Data Archive). This recoding is unlikely to have produced an exact correspondence between individual industrial and occupational categories, between 1977 and 1983. This too will have introduced noise into the calculations. The effect of these problems was to cause a few odd results. These are pointed out where they occur.

4.1.4. The Rest of the Chapter

The outline of the rest of this Chapter is as follows. Section 4.2 reports the results of the application of the shift-share technique to the data for school leavers of both genders taken together. Section 4.3 reports the results of the application of the shift-share technique to the data for female school leavers' employment. Section 4.4 reports the results of the application of the shift-share technique to the data for male school leavers' employment. Section 4.5 compares the results for male and female school leavers. Section 4.6

contains the conclusions.

Finally, the data utilised here is restricted to leavers from state sector schools in the four regions of Strathclyde, Tayside, Lothian and Fife. The reasons for these restrictions were given in Section 2.4.2 of Chapter Two. The analysis uses SEDA estimates which were weighted in order to take into account known dis-proportionate stratification and known non-response associated with school leaver's gender and Scottish Certificate of Education attainment. The SEDA estimates were grossed up in order to provide population estimates in the manner describe in Section 2.5.1 of Chapter Two, and it is these reconstructed figures which are utilised below.

4.2. Both Genders

Table 4.1 shows the results of performing the shift-share decomposition on the figures for all (both genders) school leavers' employment in 1977 and 1983. The computational stages involved in deriving these figures are shown in Tables A4.1 and A4.2 in Appendix 4.1.[2]

Turning first to the pattern of net shifts, from the figures given in Table 4.1 it can be seen that the following occupational categories experienced positive net shifts, i.e. increased their shares of school leavers' total employment between 1977 and 1983: Health Professions etc; Literary, Artistic and Sports Occupations; Engineers, Scientists etc; Clerical Occupations etc; Other Transferable Craftsmen, and, Personal Service Occupations. By far the largest positive net shift in school leavers' employment was experienced in Clerical Occupations etc. Negative net shifts, i.e. decreases in occupational category's shares of school leavers' total employment between 1977 and 1983, were experienced in the following categories: Managers and Administrators; Technicians, Draughtsmen; Non-Transferable Craftsmen; Skilled Operatives;

Table 4.1

School Leavers' Net Shifts and Components of Net Shift, Both Sexes, 1977-83

WOC	Net Shift	COMPONENTS OF NET SHIFT Industry Effect	Occupational Composition Effect	Interaction Effect
1. Managers and administrators	-220	+79	-233	-66
2. Education professions	0	+1	-16	+15
3. Health professions etc.	+944	+188	+599	+157
4. Other professions	0	+33	-27	-6
5. Literary, artistic and sports occupations	+32	-29	+83	-22
6. Engineers, scientists, etc.	+126	+11	+60	+55
7. Technicians, draughtsmen	-503	+81	-477	-107
8. Clerical occupations, etc.	+1391	+1200	+493	-302
9. Sales occupations	+3	+262	-267	+8
10. Supervisors, foremen	0	+6	0	-6
11. Engineering craftsmen	+4	-433	+27	+410
12. Other transferable craftsmen	+726	+546	-160	+340
13. Non-transferable craftsmen	-1664	-1398	-420	+154
14. Skilled operatives	-439	-247	-71	-121
15. Other operatives	-215	-131	+207	-291
16. Security occupations	-62	+230	-237	-55
17. Personal service occupations	+254	-383	+869	-232
18. Other occupations	-377	-28	-427	+78
All Occupations	0	-12	+3	+9

Other Operatives; Security Occupations, and, Other Occupations. By far the largest negative net shift in school leavers' employment was experienced in Non-Transferable Craftsmen. Finally, zero net shifts in school leavers' employment, i.e. no change in occupational category's shares of school leavers' total employment between 1977 and 1983, were experienced in: Education Professions; Other Professions; Sales Occupations, and, Engineering Craftsmen.[3]

Turning now to the components of these net shifts,[4] it can be seen from Table 4.1 that the pattern displayed by the components of the net shifts, is rather difficult to interpret. This is a consequence of the problems mentioned in sub-section 4.1.3 above, i.e. the noise created by sampling variation, the difference in sample sizes between 1977 and 1983, and, the recoding of occupations between 1977 and 1983. In order to make the underlying trends easier to see, it was decided to condense the eighteen categories of the WOC into five occupational groups. These groups are: White Collar Occupations (WOCs 1 to 8), Sales Occupations (WOC 9), Skilled Manual Occupations (WOCs 10 and 11), Intermediate Manual Occupations (WOCs 12 to 14), and, finally, Unskilled Manual Occupations (WOCs 15 to 18). The relationship between the eighteen WOC categories and the five occupation groups is shown in Appendix 4.2. The aim in creating these groups was to maximise internal homogeneity and the differences between the groups.

Table 4.2 shows the net shifts and the components of those net shifts experienced by school leavers in the five occupational groups. The main trend was an increase in the relative importance of White Collar Occupations at the expense of Intermediate and Unskilled Manual Occupations. The largest part of the White Collar Occupations' positive net shift was experienced in Clerical Occupations etc, and, the largest part of Intermediate and Unskilled Manual Occupations' negative net shift was experienced in Non-Transferable Craftsmen.

Table 4.2

School leavers' net shifts and components of net shift by occupation group, both sexes, 1977-83

Occupation Group	Net Shift	COMPONENTS OF NET SHIFT		
		Industry Shift Effect	Occupational Shift Effect	Interaction Effect
1. White Collar Occupations (WOC's 1 to 8)	+1770	+1564	+482	-276
2. Sales Occupations (WOC 9)	+3	+262	-267	+8
3. Skilled Manual Occupations (WOC's 10 and 11)	+4	-427	+27	+404
4. Intermediate Manual Occupations (WOC's 12 to 14)	-1377	-1099	-651	+373
5. Unskilled Manual Occupations (WOC's 15 to 18)	-400	-312	+412	-500
All Occupations	0	-12	+3	+9

It can be seen from Tables 4.1 and 4.2 that the largest component of these net shifts was the industry shift effect.[5] From Table 4.1 it can be seen that the largest part of the positive industry shift effect experienced in White Collar Occupations, and, the negative industry shift effects experienced in Intermediate and Unskilled manual occupations were experienced in the WOC categories Clerical Occupations etc, and, Non-Transferable Craftsmen, respectively.

Turning now to the occupational composition shift effect, it can be seen from Table 4.2 that the overall pattern was one of positive occupational composition shift effects for White Collar, Skilled and Unskilled Manual Occupations, and negative occupational composition shift effects for Intermediate Manual and Sales Occupations. In the case of White Collar Occupations, its positive occupational composition shift effect represented a sizeable part of its positive net shift. It can be seen from Table 4.1, that the largest single positive occupational composition shift effect was experienced in the WOC category Personal Service Occupations and that the largest positive occupational composition shift effects, within the White Collar Occupation group, were experienced in the WOC categories Health Professions, and, Clerical Occupations etc. The largest negative occupational composition shift effects were experienced in: Technicians, Draughtsmen; Other Occupations, and, Non-Transferable Craftsmen.

To summarise the above, the major trend in school leavers' employment was the increase in the relative importance of White Collar Occupations, at the expense of manual occupations. This trend was found to be largely due to changes in the industrial distribution of school leavers' employment; particularly, the relative decline in the importance of the manufacturing industries and the relative growth in the importance of the service industries.

4.3. Females

Table 4.3 shows the results of performing the shift-share decomposition on the figures for female school leavers' employment in 1977 and 1983. The computational stages involved in deriving these figures are shown in Tables A4.3 and A4.4 in Appendix 4.1.

From the figures given in Table 4.3 it can be seen that the following occupational categories experienced positive net shifts: Clerical Occupations etc; Health Professions etc, Personal Service Occupations; Engineers, Scientists etc; Skilled Operatives, and, Education Professions. Negative net shifts were experienced in: Non-Transferable Craftsmen; Other Operatives; Sales Occupations; Managers and Administrators; Other Occupations; Literary, Artistic and Sports Occupations; Security Occupations; Engineering Craftsmen, and, Other Transferable Craftsmen. Finally, zero net shifts were experienced in: Technicians, Draughtsmen, and, Supervisors, Foremen.[6] By far the largest positive net shifts were experienced in: Clerical Occupations etc, and Health Professions etc. The largest negative net shift was experienced in Non-Transferable Craftsmen.

Turning now to the components of the net shifts, Table 4.4 shows the net shift and components of that net shift for each of the five occupational groups. The main pattern shown by the net shifts in Table 4.4 is already familiar: an increase in the relative importance of White Collar Occupations, mainly at the expense of Intermediate and Unskilled Manual Occupations (but also Sales and Skilled Manual Occupations). The largest individual parts of the positive net shift experienced in the White Collar Occupation group were experienced in Clerical Occupations etc and Health Professions etc, and, the largest part of the negative net shift experienced in the manual occupation groups was experienced in Non-Transferable Craftsmen.

Table 4.3

Female School Leavers' Net Shifts and Components of Net Shift, 1977-83

WOC	Net Shift	COMPONENTS OF NET SHIFT		
		Industry Effect	Occupational Composition Effect	Interaction Effect
1. Managers and administrators	-86	+27	-98	-15
2. Education professions	+14	+5	+13	-4
3. Health professions etc.	+877	+309	+411	+157
4. Other professions	+29	+2	+10	+17
5. Literary, artistic and sports occupations	-43	+8	-36	-87
6. Engineers, scientists, etc.	+72	0	+59	+13
7. Technicians, draughtsmen	+1	+58	+17	-74
8. Clerical occupations, etc.	+980	+974	+179	-173
9. Sales occupations	-182	+69	-221	-30
10. Supervisors, foremen	0	0	0	0
11. Engineering craftsmen	-14	-50	+18	+18
12. Other transferable craftsmen	-15	+10	-9	-16
13. Non-transferable craftsmen	-1247	-883	-537	+173
14. Skilled operatives	+29	-69	+170	-72
15. Other operatives	-487	-438	-121	+72
16. Security occupations	-43	+40	-63	-20
17. Personal service occupations	+204	-20	+228	-4
18. Other occupations	-86	-43	-42	+43
All Occupations	+3	-1	0	+4

Table 4.4

Female school leavers' net shifts and components of net shift by occupation group, 1977-83

Occupation Group	Net Shift	COMPONENTS OF NET SHIFT		
		Industry Shift Effect	Occupational Shift Effect	Interaction Effect
1. White Collar Occupations (WOC's 1 to 8)	+1844	+1383	+627	-166
2. Sales Occupations (WOC 9)	-182	+69	-221	-30
3. Skilled Manual Occupations (WOC's 10 and 11)	-14	-50	+18	+18
4. Intermediate Manual Occupations (WOC's 12 to 14)	-1233	-942	-376	+85
5. Unskilled Manual Occupations (WOC's 15 to 18)	-412	-461	-48	+97
All Occupations	+3	-1	0	+4

It can be seen from Table 4.4 that, once again, the largest component of these net shifts was usually the industry shift effect, the exception being Sales Occupations, for which the occupational composition shift effect was larger. From Table 4.3 it can be seen that the largest parts of the positive industry shift effect experienced in the White Collar Occupations were accounted for by Clerical Occupations etc and Health Professions etc. The largest parts of the negative industry shift effect experienced in Intermediate and Unskilled Manual Occupations were accounted for by Non-Transferable Craftsmen and Other Operatives.

Turning now to the occupational composition shift effect, it can be seen from Table 4.4 that the overall pattern was for the White Collar Occupations to gain at the expense of all the other occupational groups; especially Sales Occupations and Intermediate Manual Occupations. For the White Collar Occupations group, the occupational composition shift effect represented a significant part of its positive net shift. It can be seen from Table 4.3 that the largest positive occupational composition shift effects were experienced in: Health Professions etc; Clerical Occupations etc, and, Personal Service Occupations. The largest negative occupational composition shift effects were experienced in: Non-Transferable Craftsmen; Sales Occupations, and, Other Operatives.

To summarise the above, the main conclusions, in the case of female school leavers, are the same as those for both genders taken together, that is, there was a relative shift towards the White Collar Occupations, principally at the expense of manual occupations, and mainly due to the industry shift effect.

4.4. Males

Table 4.5 shows the results of performing the shift-share decomposition on the figures for male school leavers' employment in 1977 and 1983. The computational stages involved in deriving these figures are described in Tables A4.5 and A4.6 in Appendix 4.1.

From the figures given in Table 4.5 it can be seen that the following occupational categories experienced positive net shifts: Other Transferable Craftsmen; Clerical Occupations etc; Other Operatives; Sales Occupations; Literary Artistic and Sports Occupations; Personal Service Occupations; Health Professions etc, and, Engineers, Scientists etc. Negative net shifts were experienced in: Technicians, Draughtsmen; Skilled Operatives; Non-Transferable Craftsmen; Other Occupations; Managers and Administrators; Other Professions; Education Professions, and, Engineering Craftsmen. The largest positive net shifts were experienced in: Other Transferable Craftsmen; Clerical Occupations etc, and, Other Operatives. Security Occupations and Supervisors, Foremen had zero net shifts.[7] The largest negative net shifts were experienced in: Technicians, Draughtsmen; Skilled Operatives, and, Non-Transferable Craftsmen.

Turning now to the components of the net shifts, Table 4.6 shows the net shift and the components of that net shift for each of the five occupational groups. The pattern displayed in Table 4.6 differs from that for female school leavers, shown in Table 4.4, in three main ways. Firstly, the sizes of the net shifts shown in Table 4.6 are much smaller than those shown in Table 4.4. This reflects the fact that male school leavers' occupational distribution of employment was more stable than female school leavers' over the period 1977-83. Secondly, the White Collar Occupations experienced a small negative net shift in the case of male school leavers, whereas, in the case of female school leavers, they experienced a large positive net shift. A final difference

Table 4.5

Male School Leavers' Net Shifts and Components of Net Shift, 1977-82

WOC	Net Shift	COMPONENTS OF NET SHIFT		
		Industry Effect	Occupational Composition Effect	Interaction Effect
1. Managers and administrators	-138	+60	-156	-42
2. Education professions	-26	+5	-26	-5
3. Health professions etc.	+77	-23	+136	-36
4. Other professions	-46	+13	-51	-8
5. Literary, artistic and sports occupations	+92	-29	+174	-53
6. Engineers, scientists, etc.	+45	+1	+9	+35
7. Technicians, draughtsmen	-509	-51	-445	-37
8. Clerical occupations, etc.	+499	+273	+337	-111
9. Sales occupations	+158	+127	+16	+15
10. Supervisors, foremen	-5	0	-5	0
11. Engineering craftsmen	-35	-480	-20	+465
12. Other transferable craftsmen	+731	+515	-194	+410
13. Non-transferable craftsmen	-421	-496	+170	-95
14. Skilled operatives	-479	-93	-349	-37
15. Other operatives	+264	+227	+353	-316
16. Security occupations	-7	+154	-127	-34
17. Personal service occupations	+79	-193	+586	-314
18. Other occupations	-278	-8	-361	+91
All Occupations	+1	+2	+2	-3

Table 4.6

Male school leavers' net shifts and components of net shift by occupation group, 1977-83

Occupation Group	Net Shift	COMPONENTS OF NET SHIFT		
		Industry Shift Effect	Occupational Shift Effect	Interaction Effect
1. White Collar Occupations (WOC's 1 to 8)	-6	+249	-67	-188
2. Sales Occupations (WOC 9)	+158	+127	+16	+15
3. Skilled Manual Occupations (WOC's 10 and 11)	-40	-480	-25	+465
4. Intermediate Manual Occupations (WOC's 12 to 14)	-169	-74	-373	+278
5. Unskilled Manual Occupations (WOC's 15 to 18)	+58	+180	+451	-573
All Occupations	+1	+2	+2	-3

between male and female school leavers' experiences was that Sales Occupations experienced a positive net shift, in the case of male school leavers, and a negative net shift, in the case of female school leavers.

From Table 4.5 it can be seen that in the case of White Collar Occupations, the large positive net shift experienced in Clerical Occupations etc, and the smaller positive net shifts experienced in Health Professions etc; Literary, Artistic and Sports Occupations; and Engineers, Scientists etc, were slightly more than offset by a large negative net shift in Technicians, Draughtsmen, and smaller negative net shifts in the remaining White Collar Occupations.

From Table 4.6 it can be seen that, once again, the industry shift effect was usually the largest component of the net shifts, the exceptions being: Intermediate Manual Occupations, where the occupational composition shift effect was largest, and Unskilled Manual Occupations, where the interaction effect was largest. In the case of White Collar Occupations, the largest (positive) industry shift effect was experienced in Clerical Occupations etc. In the case of the manual occupation groups, the largest negative industry shift effects were experienced in Engineering Craftsmen and Non-Transferable Craftsmen, and, the largest positive industry shift effect was experienced in Other Transferable Craftsmen.

Turning now to the consideration of the occupational composition shift effect, it can be seen from Table 4.6 that the overall pattern was for Unskilled Manual Occupations and Sales Occupations to gain at the expense of the Intermediate Manual, White Collar and Skilled Manual Occupations. The biggest occupational composition shift effect was away from the Intermediate and towards the Unskilled Manual Occupations. Within this overall pattern it can be seen from Table 4.5 that the largest positive occupational composition shift

effects were experienced in: Personal Service Occupations; Other Operatives, and, Clerical Occupations etc. The largest negative occupational composition shift effects were experienced in: Technicians, Draughtsmen, and, Skilled Operatives.

To summarise the above, the main conclusions, in the case of male school leavers, were that they experienced less change in their occupational distribution of employment than female school leavers, though the apparent stability across the five occupational groups hid quite large changes amongst the eighteen occupational categories, and that the largest component of the net shifts experienced by most of the occupational groups was the industry shift-effect, though, the industry shift effect was not as predominant for male school leavers as it was for female school leavers.

4.5. The Experience of the Genders Compared

The aim in this sub-section is to examine the gender composition of each of the five occupational group's net shifts and the components of those net shifts. To that end, Table 4.7 shows male and female school leavers' net shifts and components of net shift and their combined, both genders, net shift and components of net shift, within each of the five occupational groups.[8]

From Table 4.7 it can be seen that female school leavers accounted for the largest absolute part of four of the five occupational group's net shifts, the exception being Skilled Manual Occupations. Female school leavers accounted for a particularly large proportion of the combined (both genders) net shift in the cases of White Collar and Intermediate Manual Occupations. That is, the combined, both genders, net shifts largely reflected the component due to female school leavers, because the changes in female school leavers' occupational distribution of employment were larger than those experienced by

Table 4.7

The gender division of the net shifts and components of net shift in each occupational group, 1977-83

Occupation group	Net shift			Industry shift effect			Occupational composition effect			Interaction effect		
	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total
1. White collar occupations (WOC's 1 to 8)	-6	+1844	+1838	+249	+1383	+1632	-67	+627	+560	-188	-166	-354
2. Sales occupations (WOC 9)	+158	-182	-24	+127	+69	+196	+16	-221	-205	+15	-30	-15
3. Skilled manual occupations (WOC's 10 and 11)	-40	-14	-54	-480	-50	530	-25	+18	-7	+465	+18	+483
4. Intermediate manual occupations (WOC's 12 to 14)	-169	-1233	-1402	-74	-942	-1016	-373	-376	-749	+278	+85	+363
5. Unskilled manual occupations (WOC's 15 to 18)	+58	-412	-354	+180	461	-281	+451	-48	+403	-573	+97	-476
All occupations	+1	+3	+4	+2	-1	+1	+2	0	+2	-3	+4	+1

male school leavers.

Turning to the components of the net shifts, it can be seen from Table 4.7 that the greatest difference between the genders lay in the size of their industry shift effects, which were largest for females. The industry shift effect went in the same direction for both genders in four of the five occupational groups; the exception being Unskilled Manual Occupations, where it was positive for males but negative for females. In the cases of White Collar Occupations and Intermediate and Unskilled manual occupations, female school leavers accounted for the majority of the combined, both genders', industry shift effects. In the cases of Sales and Skilled Manual Occupations, it was male school leavers who accounted for the majority of the combined (both genders) industry shift effects.

It can be seen from Table 4.7 that in four out of five cases, the sign of the occupational composition shift effect differed between the genders. It only agreed in the case of Intermediate Manual Occupations. With the exceptions of Skilled and Unskilled Manual Occupations, female school leavers' occupational composition shift effects were larger in absolute value than male school leavers'. In the case of Intermediate Manual Occupations, the occupational composition shift effects were almost equal in size between the genders.

How can the above described pattern of net shifts be explained? The basic reason for the differences between the two gender's experiences was primarily the greater industrial concentration of female school leavers' employment, as compared to male school leavers' employment. That in turn meant that male school leavers' employment was less affected by changes which only affected one or two industries. Hence, their net shifts and industry shift effects were generally smaller than those experienced by female school leavers.

4.6. Conclusion

The analysis contained in this Chapter indicated that the largest part of the net shifts in school leavers' employment between the eighteen WOC's and the five occupation groups was usually attributable to the industry shift effect. Female school leavers' net shifts and industry shift effects were usually larger in absolute size than male school leavers'.

The fact that the industry shift effect usually predominated is not too surprising since the type of changes in technology and work organisation which would produce significant occupational composition shift effects are likely to occur gradually over time. In contrast, the combination of a high exchange rate, tight fiscal and monetary policies, high interest rates, etc, which Britain experienced at the turn of the present decade and in the early 1980's, plus the increase in the price of oil and the decline in world trade which occurred at the same time, produced rapid and dramatic changes in Britain's industrial structure. In particular, the manufacturing industries were severely affected and experienced a rapid decline in their share of total employment (see Chapter Two). Finally, the fact that female school leavers experienced larger industrial shift effects, and hence larger net shifts, than males probably reflected the high degree of concentration of their employment.

Footnotes

1. In the 1977 Scottish School Leavers' Survey sample there were 4,317 school leavers recorded as in the labour market, the equivalent figure for 1983 was 1,742.

2. Summing across occupational categories, the net shift, industry shift effect, occupational composition shift effect, and interaction effect totals should all be zero. However, rounding errors meant that this was seldom the case in practice.

3. Both Sales Occupations and Engineering Craftsmen have small positive net shifts shown in Table 4.1. These are solely due to rounding errors.

4. Since the interaction effect is, in fact, a residual the precise causes of which are not entirely clear it is not commented on in the main text.

5. In their paper, Browning and Singelmann (1980) found that the largest positive net shifts in the occupational distribution of all ages' employment in the US, between 1960 and 1970, were experienced by Clerical Workers, Professionals, Semi Professionals, and, Service Workers. The largest negative net shifts were experienced by Operatives, Farmers, and Farmworkers. Browning and Singelmann discovered that the changes in the US occupational distribution during this period were mainly the result of the industry shift effect.

   J.Singlemann recently (spring 1985) presented a paper to an Edinburgh University Survey Methodology Group Meeting. At that meeting he handed out a set of Tables showing the same decomposition as used in Singelmann and Browning (1980) but covering the period 1960-80. From those tables it could be seen that between 1970 and 1980, the largest positive net shifts were experienced by white collar occupations and the largest negative net shifts by manual occupations. Once again, the industry shift effect was the largest component of these net shifts.

6. The small positive net shift shown for Technicians, Draughtsmen is due to rounding errors. The result for Supervisors, Foremen was due to rounding errors and this category will be ignored from now on.

7. The small negative net shifts shown for Supervisors, Foremen and Security Occupations were due to rounding errors.

8. No attempt is made here to describe the differences between the occupational distributions of male and female school leavers' employment in any great detail, since this is covered in the occupational analysis in the previous chapter.

CHAPTER 5

THE PROXIMATE SOURCES OF SCOTTISH SCHOOL LEAVERS' ABSOLUTE CHANGE IN EMPLOYMENT 1977-81 AND 1979-83

5.1. Introduction

The two main aims in this Chapter are, firstly, to use data relating to Scottish school leavers' and Scottish all ages' industrial distributions of employment in order to discover the proximate sources of the large declines in Scottish school leavers' employment between 1977 and 1981, and, 1979 and 1983.[1] And, secondly, to examine the similarities and differences between Scottish school leavers' and all ages' industrial distributions of employment in 1977, 1979, 1981 and 1983.

Considering the first aim, the study of the proximate sources of the decline in school leavers' employment is, in fact, the study of the rise in their non-employment, i.e. unemployment plus participation on State schemes for the unemployed, since as we shall see in Chapter Six, the decline in school leavers' employment was *the* cause of the rise in their total non-employment between 1977 and 1983.

As Main and Raffe (1983a) argued in their article on Scottish school leavers' industrial destinations, the rise in youth unemployment in the late 1970s and early 1980s ought to, and had, given rise to considerable concern. This concern centred around feelings of compassion for the young, fears of the social consequences of mass youth unemployment, e.g. delinquency, riots, crime, political upheaval, and, finally, the belief that since individuals traditionally acquire a large part of their human capital stock in their early years in the labour market, unemployment during this period was particularly harmful.

Because of its importance, the question of why school leavers' employment declined forms the central focus of this Chapter.

The study of the decline in school leavers' employment contained in this Chapter can also be used to answer some of the questions raised in the discussion of different explanations of the decline in young peoples' employment contained in Chapter One. For instance, according to the demand deficiency explanation, the decline in firms' recruitment played a major part in causing young peoples' employment to decline in a greater proportion than all ages'. Whereas, according to the structural explanation, a part of the decline in young peoples' employment can be attributed, firstly, to the concentration of their employment in industries in which all ages experienced a particularly large decline in their employment, and, secondly, to the increased competition from all age part-time workers in the service industries. The focus in the shift-share analysis below is on recruitment ratios, i.e. the proportion of all ages' employment accounted for by school leavers in an industrial category, and on structural change and the results of the shift-share analysis will allow one to compare the relative impact on school leavers' total employment, of the decline in industries' recruitment and structural change.

Turning to the second aim, the main reason for studying the relationship between all ages' and school leavers' industrial distributions of employment is in order to better understand the processes which allocate particular types of jobs to particular groups of workers. Ashton and Maguire (1982) have argued that "group competition" for jobs, as they call it, produces three types of jobs for young people: sheltered, closed and exposed. Sheltered jobs are those which are reserved exclusively for young people. Closed jobs are those from which young people are excluded. Exposed jobs are those for which young people and adults compete. The study of the relationship between all ages' and

school leavers' industrial distributions of employment will, hopefully, allow one to discover in which industries school leavers' sheltered and closed jobs were concentrated and to discover the processes which may have restricted school leavers' choice of jobs. This restriction on choice is important because a school leaver's initial choice of job may be expected to have important consequences for the course of their future career.

Turning to the details of the analysis contained in this Chapter, the lack of sufficiently detailed data for all ages' employment in 1979 and 1983 meant that the analysis had to be undertaken at different levels of industrial aggregation between 1977 and 1981, and, between 1979 and 1983.[2] In 1977 and 1981, data from the Censuses of Employment were provided at a sufficiently disaggregated level to enable the analysis to be conducted at the level of the 23 industrial categories employed in Chapter Two. Due to the fact that no Censuses of Employment were undertaken in 1979 and 1983, the data relating to all ages' industrial distributions of employment in those years was only provided at a higher level of aggregation, and it is not possible to use the 23 way industrial classification system. Furthermore, the data relating to 1979 and 1983, unlike the data relating to 1977 and 1981, was not disaggregated according to gender and full-time and part-time employment status.

The structure of the rest of the Chapter is as follows. Section 5.2 contains a critical examination and a mathematical and graphical account of the shift-share technique to be employed. Section 5.3 contains the discussion of the similarities and differences between school leavers' and all ages' industrial distributions of employment in 1977 and 1981. Section 5.4 contains the discussion of the results of applying the shift-share decomposition to the decline in school leavers' employment between 1977 and 1981. Section 5.5 moves the time-frame of analysis on to 1979 and 1983, and contains the

discussion of the similarities and differences between school leavers' and all ages' industrial distributions of employment in those two years. Section 5.6 contains the discussion of the results of applying the shift-share decomposition to the decline in school leavers' employment between 1979 and 1983. Finally, Section 5.7 contains concluding remarks.

5.2. The Shift-Share Technique

5.2.1. The Mathematical and Graphical Exposition of the Shift-Share Technique

The shift-share technique to be used here is that popularised by Perloff *et al.* (1960), via their study of regional differences in employment growth in the United States, and was used by Main and Raffe (1983a) and Raffe (1984c), in their studies of the proximate sources of the decline in Scottish school leavers' employment between 1977 and 1981, and, 1979 and 1983, respectively.

The technique operates in the following manner. First, note that the actual change in school leavers' employment, between any two years, can be written as:

(5.1) $S_t - S_{t-1} = \Sigma_{i=1}^{n} (Sit - Sit-1)$

where:

S_t = Total (all industries) school leaver employment in year t

S_{t-1} = The same in year t-1

Sit = School leavers' employment in industrial category i in year t

Sit-1 = The same in year t-1

The actual change in school leavers' employment can be divided into two parts: that part they would have experienced if their employment, in each industrial category, had declined in the same proportion as total (all industries) all ages' employment, and, the remainder. These two parts have been called

the "national component" and the "combined structural and differential component" by Fothergill and Gudgin (1982) in their study of urban and regional employment change in the UK., and this terminology will be used in explaining the technique.

The decomposition of the actual change in school leavers' employment into the national component and the combined structural and differential components is shown by (5.2):

$$(5.2)\quad \Sigma_{i=1}^{n}(Sit - Sit{-}1) = \Sigma_{i=1}^{n}[(Nt/Nt{-}1).Sit{-}1 - Sit{-}1] + \Sigma_{i=1}^{n}[Sit - (Nt/Nt{-}1).Sit{-}1]$$

where:

Nt = Total (all industries) all ages' employment in year t.

Nt−1 = The same in year t−1

The first term on the right hand side of (5.2) shows the national component, and the second term shows the combined structural and differential components.

If, within industrial categories, school leavers' employment, changed by a different proportion than all ages' employment, then the proportion of all ages' employment, within industrial categories, accounted for by school leavers, i.e. industrial category's recruitment ratios (as they were called by Main and Raffe (1983a)), would change and school leavers' total employment would decline by a greater proportion than all ages' total employment. This part of the decline in school leavers' employment can, therefore, be attributed either to the differential employment change within industries, i.e. the differential component, or, equivalently, to the decline in recruitment ratios. It is here attributed to the decline in recruitment ratios.

If school leavers' employment had a different industrial distribution than all

ages', then, school leavers' total employment would have been affected by the changes in individual industry's shares of all ages' total employment, i.e. structural change. For instance, if school leavers' employment was concentrated in industries in which all ages' employment declined by more than average, i.e. industries which experienced a decline in their shares of all ages' employment, then school leavers' total employment would decline by a greater proportion than all ages' total employment, even if each industry's recruitment ratio remained unchanged. This part of the change in school leavers' employment is the structural component.

Equation (5.3) shows the decomposition of the combined structural and recruitment ratio component into that part attributable to the change in industry's recruitment ratios and that part attributable to structural change:

$$(5.3)\ \Sigma_{i=1}^{n}[Sit - (Nt/Nt-1).Sit-1] = \Sigma_{i=1}^{n}[rit-1.(pit - pit-1).Nt] + \Sigma_{i=1}^{n}[(rit - rit-1).pt.Nt]$$

where:

pit = The share of all ages' total employment accounted for by industrial category i in year t.

pit−1 = The same in year t−1

rit = Industry i's recruitment ratio in year t

rit−1 = The same in year t−1

The first term on the right hand side of (5.3) shows the structural component and the second term on the right hand side of (5.3) shows the recruitment ratio component.

In Technical Appendix 5.1, it is shown that, firstly, taken together, the national component and the combined structural and recruitment ratio component account for all of school leavers' actual change in employment, and, secondly, that the combined structural and recruitment ratio component can be

decomposed into the structural and recruitment ratio components.

Substituting (5.3) into (5.2) yields:

$$(5.4)\quad \Sigma_{i=1}^{n}(Sit - Sit{-}1) = \Sigma_{i=1}^{n}[(Nt/Nt{-}1).Sit{-}1 - Sit{-}1]$$
$$+ \Sigma_{i=1}^{n}[rit{-}1.(pit - pit{-}1).Nt]$$
$$+ \Sigma_{i=1}^{n}[(rit - rit{-}1).pt.Nt]$$

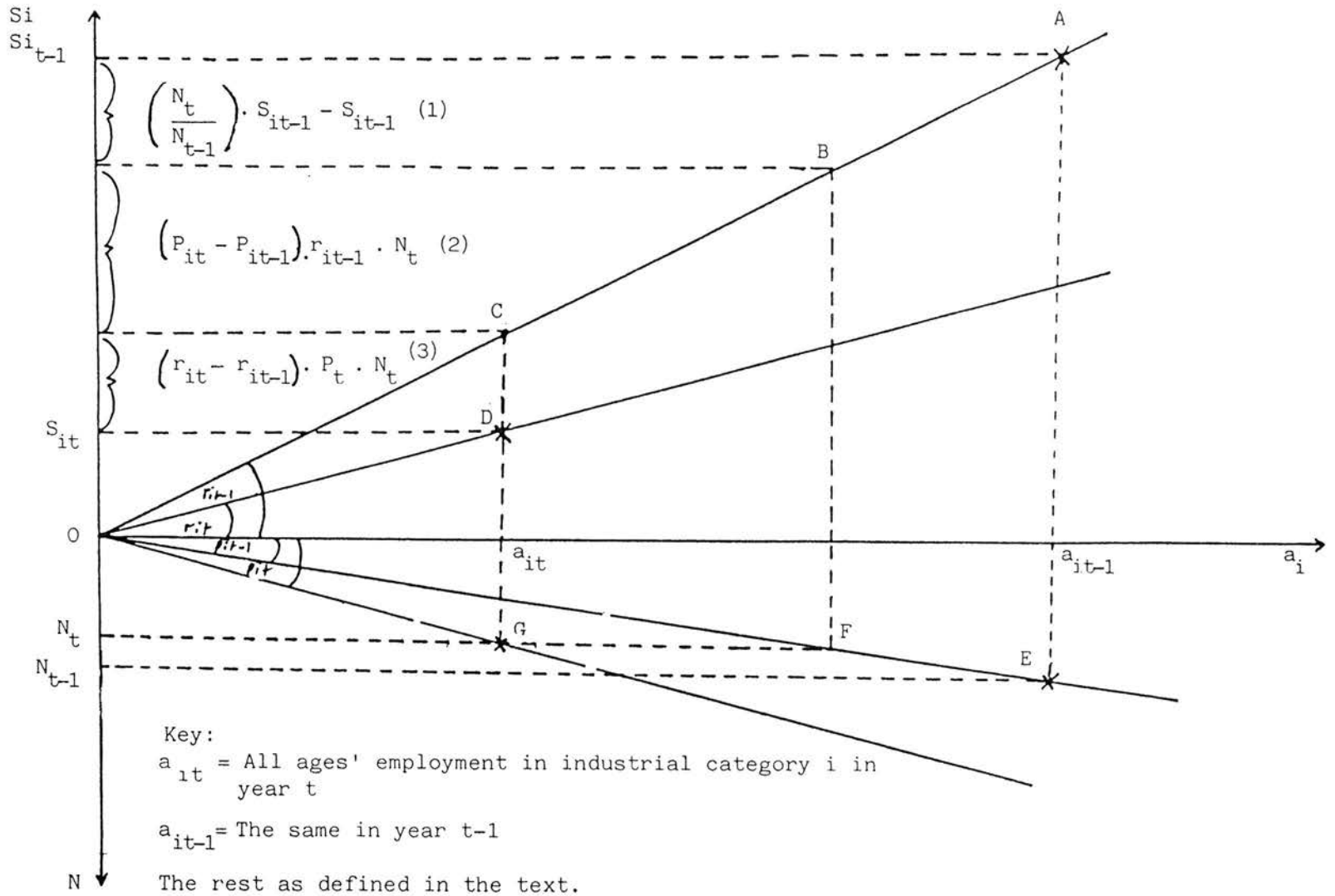
Equation (5.4) shows how the change in school leavers' employment in each industrial category, and across all industrial categories, can be decomposed into the three components. If both sides of (5.4) are multiplied by $(100/Si_{t-1})$ it is possible to calculate the percentage of school leavers' net employment change attributable to each of the three components in each industrial category separately, and over all industrial categories taken together.

The decomposition of the net change in school leavers' employment into three components, can also be illustrated diagramatically. In Figure 5.1, points A and D represent the observed combinations of school leavers' and all ages' employment in industry i in years t and t+1, respectively. Similarly, points E and G show the observed combinations of all ages' employment in industrial category i and all ages' total employment, in years t and t+1, respectively. The lines from the origin through A and D have slopes equal to r_{it} and r_{it-1} respectively, where r_{it} represents the recruitment ratio of industry i in year t, etc. Similarly, the lines from the origin through G and E have slopes equal to p_{it} and p_{it-1} respectively, where p_{it} represents the share of industry i in total all ages' employment in year t, etc.

The net change in school leavers' employment between the two years is shown by a move from A to D. This move can be broken into three parts:

Part One. Assume that the share of industry i in all ages' total employment

Figure 5.1: A Graphical Account of The Shift-Share Technique



Key:

a_{it} = All ages' employment in industrial category i in year t

a_{it-1} = The same in year t-1

The rest as defined in the text.

and industry i's recruitment ratio do not change, but that all ages' total employment falls.

This part is shown by the move from A to B in the upper part of the diagram.

Part Two: Assume that all ages' employment in industrial category i falls by the observed amount and, therefore, that the industrial category's share of all ages' total employment also falls, but that its recruitment ratio does not change.

This part, i.e. the part attributable to structural change, is shown by the move from B to C in the upper part of the diagram and from F to G in the lower part of the diagram.

Part Three: Allow for the change in industry i's recruitment ratio.

This part, i.e. the part attributable to the decline in industry's recruitment ratios, is shown by the move from C to D in the upper part of the diagram.

5.2.2. The Technique Critically Examined

Since its popularisation by Perloff *et al.* (1960), the shift-share technique employed in this Chapter has been extensively utilised in the field of regional economics (See Richardson, 1978; Danson *et al.*, 1980; Fothergill and Gudgin, 1982; and Holden *et al.*, 1986; for references) to examine differences in employment growth between regions and for the evaluation of the effectiveness of regional policy. As Richardson (1978) notes the popularity of the technique, for the above purposes, owes much to its ease of implementation and its intuitive appeal.

In the regional economics literature, the shift-share technique has been

strongly attacked by Richardson (1978), vigorously defended by Fothergill and Gudgin (1979), and, attacked once again by Holden *et al.* (1986). Richardson (1978) listed six deficiencies of the shift-share technique. They were, firstly, that the results were sensitive to the level of industrial disaggregation; secondly, that the technique had an inherent index number problem; thirdly, that the differential component tends to be unstable; fourthly, that the technique underestimates the impact of industrial composition since it ignores inter-industry linkages and multiplier effects; fifthly, that the technique itself tells us nothing about the sources of the differential component, and; finally, that the differential component may be influenced in a spurious manner by data deficiencies, e.g. industry mis-classifications, product heterogeneity within firms, etc. Holden *et al.* (1986) criticised the technique on two grounds, firstly, that its use implies a particular account of regional employment growth, and, secondly, that it does not fully separate the structural and differential components and that, therefore, the differential component is influenced by the industrial distribution of employment within regions.

Turning to Richardson's (1978) first criticism, i.e. sensitivity to the level of industrial aggregation, when the shift-share technique was applied to the change in school leavers' employment over the period 1979 to 1983 by Raffe (1984c), the sizes of the three components were extremely close to those found here despite the fact that Raffe (1984c) used a different industrial classification schema to that used here (and had slightly different data).

The second deficiency, the index number problem, is not really a problem. As Fothergill and Gudgin (1979) point out, the choice of base year for the shift-share analysis is determined by the question being asked. The present questions are: to what extent was school leavers' decline in employment accounted for by their *pre-existing* concentration of employment in certain

industries, i.e. structural causes, to what extent by the decline in industry's recruitment ratios from their *pre-existing* levels and, finally, to what extent by the decline in all ages' total employment. This set of questions dictate that the earlier year be taken as the base year.

The third deficiency, i.e. that the differential component is unstable over time and across industries, is hardly a deficiency, since, as Fothergill and Gudgin (1979) point out, the circumstances of individual industries differ at a point in time and change over time. In the present instance, it is to be expected that industries will differ according to whether and when they reduced school leaver recruitment and, if they did, in the extent to which they did so. As the economic environment changed over time, each industry may have altered the extent to which it reduced, or even increased, school leaver employment, depending upon its fortunes and its responses to its changing fortunes. All the above factors will necessarily make the differential component, i.e. the recruitment ratio component, unstable across industries and over time.

The fourth deficiency, namely, that the true influence of industrial composition will be under-estimated because industrial linkages and multiplier effects are not accounted for (McKay, 1968), does apply. For instance, a decline in all ages' employment in metal-using industries might be expected to cause a decline in school leaver recruitment in those industries directly and a further decline indirectly via the decline in the demand for goods and services in the areas in which those industries were located. Also, it will cause a decline in the demand for the metal-producing industries' products and hence a decline in all ages' and school leavers' employment in such industries.

The fifth deficiency, i.e. that the shift-share technique itself does not

provide an explanation of the source of the differential component, is not really a problem since it is not intended to; instead, the user of the technique is required to provide the explanation. The recruitment ratio component of the change in school leavers' employment is here accounted for in terms of the demand deficiency explanation discussed in Chapter One, i.e. it is attributed to school leavers' peculiar employment vulnerability in times of economic recession.

The final deficiency, i.e. that the differential component may be influenced by data deficiencies of various kinds, is not a criticism of the technique but rather of the data used. (Fothergill and Gudgin, 1979)

Turning to Holden *et al.*'s (1986) critique of the shift-share technique, their first criticism, i.e. that the technique implicitly assumes a particular account of regional employment change, is obviously not relevant here.[3] Their second criticism, i.e. that the size of the differential component is not independent of the industrial distribution of employment within regions, does apply here. The essence of their point can be explained via the following example. Imagine that one particular industry experienced a particularly severe decline in its fortunes. That industry might well decide to use a reduction in recruitment as means of reducing employment. If school leavers' employment had been initially concentrated in this industry then this development would significantly boost that part of the change in school leavers' total, i.e. taken across all industries, employment that was attributed to the decline in industry's recruitment ratios. So, the initial industrial distribution of school leavers' employment and the proportion of the change in their total employment attributed to the decline in industry's recruitment ratios are not independent and one should examine the link between the two. Holden *et al.* (1986) suggest that this link should be examined by providing information relating to the

relative importance of each of the three components *within*, in this case, each industrial category, and this approach is adopted below.

5.3. Comparing All Ages' and School Leavers' Industrial Distributions of Employment in 1977 and 1981

5.3.1. Introduction

In this section, all ages' and school leavers' industrial distributions of employment are compared and contrasted in 1977 and 1981. The school leaver data are here restricted to state sector school leavers in four regions of Scotland, i.e. Fife, Lothian, Strathclyde and Tayside, because of the idiosyncracies of the 1977 and 1979 SSLS's discussed in sub-section 2.4.2. The data have been weighted in order to take into account known non-response and disproportionate stratification associated with school leaver's gender and educational attainment. Where appropriate, the SEDA sample estimates have been grossed up to population figures in the manner described in sub-section 2.5.1. Finally, the all ages data came from the 1977 and 1981 Censuses of Employment and were provided by The Scottish Office. These data are shown in Appendix Table 5.1.[4]

5.3.2. Both Genders

Tables 5.1 and 5.2 show the percentage of all ages' and school leavers' total employment in each industrial category, respectively, in 1977 and 1981. Inspection of Tables 5.1 and 5.2 shows that there were noticeable differences between the industrial distributions of all ages' and school leavers' employment in those two years.

Before commencing the analysis proper it is necessary to remind the reader of the problems caused by the need to re-classify school leavers' and all ages' industries of employment to a common industrial classification designed to

Table 5.1

Percentage of all ages employment in each industrial category, 1977 and 1981

Industrial Category	Percentage		Rank	
	1977	1981	1977	1981
1. Agriculture, Forestry and Fishing	2.35	2.23	13	13
2. Mining and Quarrying	1.88	2.36	17	11
3. Gas, Electricity and Water	1.37	1.46	20	17
4. Metal Manufacturing	1.92	1.37	16	19
5. Bricks, Pottery, Glass and Cement etc	0.84	0.64	22	22
6. Chemicals and Allied Industries	1.51	1.35	19	20
7. Mechanical Engineering	4.26	3.23	8	9
8. Electrical Engineering	2.43	2.26	12	12
9. Shipbuilding, Marine Engineering and Vehicles	3.58	3.12	10	10
10. Instrument Engineering and Metal Goods, NES	2.15	1.73	14	16
11. Food, Drink and Tobacco	4.43	4.14	7	8
12. Textiles	2.85	2.06	11	14
13. Clothing and Footwear, Leather, Leather Goods and Fur	1.70	1.39	18	18
14. Timber, Furniture, etc	0.99	0.90	21	21
15. Paper, Printing and Publishing	2.12	1.97	15	15
16. Other Manufacturing Industries	0.77	0.55	23	23
17. Construction	7.90	7.39	4	4
18. Distributive Trades	11.53	12.15	2	3
19. Miscellaneous Services	11.31	13.17	3	2
20. Transport and Communication	6.45	6.38	6	6
21. Insurance, Banking, Finance and Business Services	3.78	4.59	9	7
22. Public Administration and Defence	7.04	6.86	5	5
23. Professional and Scientific Services	16.84	18.69	1	1

Table 5.2

Percentage of school leavers' employment in each industrial category, 1977 and 1981

Industrial Category	Percentage		Rank	
	1977	1981	1977	1981
1. Agriculture, Forestry and Fishing	2.1	2.5	14	13
2. Mining and Quarrying	1.3	1.2	17	15
3. Gas, Electricity and Water	0.8	1.1	22	18
4. Metal Manufacturing	1.6	0.4	16	22
5. Bricks, Pottery, Glass and Cement etc	0.5	0.4	23	22
6. Chemicals and Allied Industries	1.1	0.6	19	21
7. Mechanical Engineering	4.0	2.9	11	11
8. Electrical Engineering	5.0	4.1	10	8
9. Shipbuilding, Marine Engineering and Vehicles	5.0	2.9	9	11
10. Instrument Engineering and Metal Goods, NES	1.3	1.2	7	15
11. Food, Drink and Tobacco	5.2	5.3	8	7
12. Textiles	3.4	1.2	12	15
13. Clothing and Footwear, Leather, Leather Goods and Fur	7.7	4.1	3	8
14. Timber, Furniture, etc	1.1	0.8	19	19
15. Paper, Printing and Publishing	2.1	1.8	14	14
16. Other Manufacturing Industries	1.0	0.7	21	20
17. Construction	7.2	9.7	5	3
18. Distributive Trades	16.4	19.7	1	1
19. Miscellaneous Services	11.2	9.4	2	4
20. Transport and Communication	2.5	3.7	13	10
21. Insurance, Banking, Finance and Business Services	6.0	9.1	6	5
22. Public Administration and Defence	7.6	10.8	4	2
23. Professional and Scientific Services	6.0	6.3	6	6

Source: SEDA op cit.

connect the 1968 and 1980 SIC's. These problems are discussed in detail in Appendix 2.4 and further discussed in Chapter Two. In the present instance, industrial re-classification problems will affect the apparent extent of industrial change experienced by school leavers between 1977 and 1981. It will not affect the figures relating to all ages' industrial distribution of employment since these figures were coded according to the 1968 SIC in each year. In the case of school leavers, the industrial categories worst affected by industrial re-classification problems were Distributive Trades and Mechanical Engineering, which had their share of school leavers' total employment artificially boosted, and, Professional and Scientific Services, which had its share of school leavers' total employment artificially diminished.

Returning to the analysis, the main differences in 1977 lay in the relative concentration of school leavers' employment in the manufacturing industries and the relative concentration of all ages' employment in the service industries. By 1981 these differences had virtually disappeared. Furthermore, the relative shift of school leavers' employment from the manufacturing to the service industries was greater than that experienced by all ages. In the case of all ages,' the service industries' share of their employment grew by 4.8 percentage points, and the manufacturing industries' share fell by 3.2 percentage points, between 1977 and 1981. The equivalent figures for school leavers were 9.3 percentage points and 12.4 percentage points, respectively. School leavers, unlike all ages, also saw the percentage of their employment accounted for by the construction industry grow; by 2.5 percentage points between 1977 and 1981.

Turning to a more detailed examination of the differences between all ages' and school leavers' industrial distributions of employment in 1977 and 1981, it can be seen from Tables 5.1 and 5.2 that school leavers were relatively

concentrated (relative to all ages) in: Electrical Engineering; Clothing and Footwear etc; Distributive Trades; Insurance, Banking, Finance and Business Services, and, in 1981, in: Public Administration and Defence, and, Construction.

The relative concentration of school leavers' employment in: Electrical Engineering, Construction, Clothing and Footwear, and, Insurance, Banking, Finance and Business Services etc., probably reflected the advantages possessed by young people for jobs which require initial training, i.e. adaptability, the ability to live on trainees' wages, their greater incentive to undertake training due to their longer pay back periods, etc. All the above industries offer school leavers jobs requiring initial training; in Electrical Engineering and Construction, male school leavers are taken on as apprentices, and in Clothing and Footwear etc., and, Insurance, Banking, Finance and Business Services, female school leavers are employed, after initial training, as machinists and clerks, respectively.

Turning to the other industries in which school leavers were over-represented, in Distributive Trades, large numbers of young people, mainly females, are employed as check-out persons and sales-assistants. Their principal attraction, for employers, being their low wage rates (Ashton and Maguire, 1986). To a certain extent, though, the increase in school leavers' over-representation in Distributive Trades between 1977 and 1981 reflected the effects of industrial re-classification problems. In Public Administration and Defence, school leavers' relative over-representation probably reflected, on the one hand, the recruitment of young males by The Armed Forces and, to a lesser extent, the Police Force, and, on the other hand, the recruitment of female school leavers as clerks in the Civil Service.

From Tables 5.1 and 5.2 it can be seen that the industrial categories in

which school leavers were relatively under-represented included: Professional and Scientific Services (which partly reflected industrial re-classification problems in 1981); Transport and Communication; Chemicals and Allied Industries; and, in 1981, Textiles; Mining and Quarrying; Miscellaneous Services and Metal Manufacturing. School leavers' under-representation in Textiles, Chemicals and Allied Industries; Mining and Quarrying and Metal Manufacturing probably reflected the decline in recruitment concomitant with the long term decline in these industries' fortunes. In the case of Mining and Quarrying, however, this explanation only applies to the declining parts of that industry; such as coal mining. The North Sea Oil component grew so rapidly that all ages' employment in this category increased between 1977 and 1981. However, many of the activities associated with North Sea oil extraction have minimum age restrictions associated with them for safety reasons.

School leavers' under-representation in Professional and Scientific Services reflected the fact that many of the occupations found in this industrial category require qualifications than can only be obtained during, or after, further or higher education, e.g. accountancy and teaching qualifications. It also partly reflected industrial re-classification problems in 1981. Many of the school leavers found in this industry were probably to be found performing relatively unskilled, supportive work. Many of the occupations found in the Transport and Communication industry also require age-related qualifications; such as HGV and PSV licences. The slight under-representation of school leavers' employment in Miscellaneous Services may well reflect the fact that much of the employment in this category is accounted for by licensed premises and that no-one under the age of 18 is allowed to work in such premises, and it may therefore be a reflection of school leavers' failure to join in the increase in all ages' employment in the drinks trade which occurred after the passing of

The Licensing (1976) Act, Scotland. It also partly reflected industrial re-classification problems in 1981.

School leavers' under-representation in Professional and Scientific Services and Miscellaneous Services may also have reflected the concentration of all ages' part-time employment in these industries. School leavers are not in the market for part-time employment and hence they might be expected to be under-represented in such industries.[5]

All ages' and school leavers' industrial distributions of employment were noticeably different in 1977 and 1981 and as Table 5.3, which contains the the index of dis-similarity figures, shows, they became increasingly dis-similar between 1977 and 1981; largely because of the changes in school leavers' industrial distribution of employment. (The index of dis-similarity is defined as the mean absolute percentage differential between the proportion of two group's employment accounted for by each industrial category.) This largely reflected the increasing differences between school leavers' and all ages' industrial distribution of employment within the manufacturing and service sectors, which to some unknown extent itself reflected the changes in school leavers' industrial distribution of employment caused by industrial re-classification problems.

Finally, Table 5.4 shows the Gini Coefficients for school leavers' and all ages' industrial distributions of employment in 1977 and 1981, and it can be seen from that table that school leavers' employment was more concentrated than all ages' employment in each year, and, that school leavers' industrial distribution of employment became more concentrated between 1977 and 1981.

Table 5.3

The index of dis-similarity, school leavers' and all ages' employment, 1977 and 1981

All Ages / School Leavers 1977	1.618
All Ages / School Leavers 1981	2.130
All Ages 1977 / All Ages 1981	0.496
School Leavers 1977 / School Leavers 1981	1.261

Table 5.4

Gini coefficients for the industrial distribution of school leavers' and all ages' employment, 1977 and 1981

	1977	1981
School Leavers	0.448	0.473
All Ages	0.452	0.451

5.3.3. Females

Tables 5.5 and 5.6 show the percentage of female all ages' and school leavers' employment, respectively, in each industrial category in 1977 and 1981. When examining the figures shown in Table 5.5 and 5.6, it should be borne in mind that like is not really being compared to like. Whilst female school leavers were overwhelmingly to be found in full-time employment, older females were increasingly to be found in part-time employment. From the information provided by The Scottish Office (see Appendix Table 5.1) it can be calculated that the proportion of female all ages working part-time increased by three percentage points between 1977 and 1981, from 35.7% to 38.7%. Since the figures given here for all ages' employment relate to full-time and part-time workers taken together, their use will conflate the differences between the changes in female all ages' full-time and part-time employment. This will cause particular problems with respect to the service industries; where both female school leavers' full-time and female all ages' part-time employment were concentrated.

Returning to the problems caused by industrial re-classification, in the present instance, the worst affected industrial categories were: Insurance, Banking, Finance and Business Services; Clothing and Footwear etc, which both had their shares of school leavers' total employment artificially boosted, and, Professional and Scientific Services, which had its share of female school leavers' total employment artificially diminished. Turning to Tables 5.5 and 5.6 it can be clearly seen that one thing all ages and school leavers had in common was the importance of the service industries. However, there were some noticeable differences between female all ages' and school leavers' industrial distributions of employment. The main difference was that school leavers' employment was noticeably more concentrated in the manufacturing

Table 5.5

The percentage of female all ages' employment in each category, with rank, 1977 and 1981

Industrial Category	Percentage		Rank	
	1977	1981	1977	1981
1. Agriculture, Forestry and Fishing	0.81	0.69	16	16
2. Mining and Quarrying	0.22	0.38	23	20
3. Gas, Electricity and Water	0.66	0.64	17	17
4. Metal Manufacturing	0.46	0.28	20	22
5. Bricks, Pottery, Glass and Cement etc	0.27	0.21	22	23
6. Chemicals and Allied Industries	0.90	0.73	15	15
7. Mechanical Engineering	1.35	0.87	14	14
8. Electrical Engineering	2.46	1.88	10	10
9. Shipbuilding, Marine Engineering and Vehicles	0.64	0.59	18	18
10. Instrument Engineering and Metal Goods, NES	1.60	1.14	12	13
11. Food, Drink and Tobacco	4.62	3.86	6	6
12. Textiles	3.75	2.61	7	7
13. Clothing and Footwear, Leather, Leather Goods and Fur	3.34	2.60	8	8
14. Timber, Furniture, etc	0.38	0.33	21	21
15. Paper, Printing and Publishing	1.80	1.57	11	11
16. Other Manufacturing Industries	0.59	0.45	19	19
17. Construction	1.38	1.52	13	12
18. Distributive Trades	16.89	16.78	2	3
19. Miscellaneous Services	16.19	18.86	3	2
20. Transport and Communication	2.81	2.58	9	9
21. Insurance, Banking, Finance and Business Services	4.81	5.83	5	4
22. Public Administration and Defence	5.94	5.30	4	5
23. Professional and Scientific Services	28.14	30.15	1	1

Table 5.6

The percentage of female school leavers' employment in each industrial category, with rank, 1977 and 1981

Industrial Category	Percentage		Rank	
	1977	1981	1977	1981
1. Agriculture, Forestry and Fishing	0.7	0.6	17	14
2. Mining and Quarrying	0.1	0.4	23	19
3. Gas, Electricity and Water	0.6	0.6	19	14
4. Metal Manufacturing	0.4	0.1	20	23
5. Bricks, Pottery, Glass and Cement etc	0.3	0.2	21	21
6. Chemicals and Allied Industries	1.2	0.6	13	14
7. Mechanical Engineering	0.8	0.5	16	18
8. Electrical Engineering	3.5	2.6	9	8
9. Shipbuilding, Marine Engineering and Vehicles	0.7	0.4	17	19
10. Instrument Engineering and Metal Goods, NEC	1.4	0.6	11	14
11. Food, Drink and Tobacco	5.1	4.0	7	7
12. Textiles	4.4	1.9	8	10
13. Clothing and Footwear, Leather, Leather Goods and Fur	14.0	8.1	2	6
14. Timber, Furniture, etc	0.3	0.2	21	21
15. Paper, Printing and Publishing	2.2	1.8	10	11
16. Other Manufacturing Industries	1.1	0.8	14	13
17. Construction	1.4	1.7	11	12
18. Distributive Trades	21.4	24.1	1	1
19. Miscellaneous Services	13.5	14.5	3	2
20. Transport and Communication	1.1	2.4	14	9
21. Insurance, Banking, Finance and Business Services	9.9	14.2	5	3
22. Public Administration and Defence	5.7	8.5	6	5
23. Professional and Scientific Services	10.2	11.3	4	4

Source: SEDA op cit.

industries than all ages' in both 1977 and 1981. Another difference between female school leavers and all ages was that school leavers experienced a larger shift away from the manufacturing industries and toward the service industries than female all ages, i.e. a thirteen percentage point shift as compared to a five percentage point shift.

Female school leavers were relatively (relative to all ages) concentrated in: Clothing and Footwear etc (which partly reflected industrial re-classification problems); Distributive Trades; Insurance, Banking, Finance and Business Services (which also partly reflected industrial re-classification problems); Public Administration and Defence, and, Other Manufacturing Industries; and were relatively under-represented in: Professional and Scientific Services (which partly reflected industrial re-classification problems); Miscellaneous Services; and, in 1981, Instrument Engineering and Metal Manufacture. These industrial categories were discussed in the previous sub-section.

The index of dis-similarity figures, given in Table 5.7, show that female all ages' and school leavers' industrial distributions of employment became increasingly dis-similar between 1977 and 1981, due mainly to the changes that occurred in school leavers' industrial distribution of employment. The changes in school leavers' industrial distribution of employment were, of course, partly due to industrial re-classification problems. Finally, Table 5.8 gives the Gini coefficients for the distributions. The coefficients show that both group's employment was almost equally concentrated in both years, and became more concentrated over the period. This increasing concentration reflected the decline in both group's employment in the manufacturing industries and the increasing predominance of the service industries.

Table 5.7

The index of dis-similarity: female school leavers' and all ages' employment 1977 and 1981

All Ages / School Leavers 1977	2.1
All Ages / School Leavers 1981	2.3
School Leavers 1977 / School Leavers 1981	1.2
All Ages 1977 / All Ages 1981	0.5

Table 5.8

Gini coefficients for the industrial distributions of female school leavers' and all ages' employment 1977 and 1981

	1977	1981
School Leavers	0.617	0.651
All Ages	0.615	0.654

5.3.4. Males

Tables 5.9 and 5.10 show the percentage of male all ages' and school leavers' total employment, respectively, in each industrial category in 1977 and 1981.

In the present instance the industrial categories most affected by industrial re-classification problems were: Distributive Trades; Mechanical Engineering, and, Electrical Engineering (which had their shares of school leavers' total employment artificially boosted), and, Miscellaneous Services (which had its share of school leavers' employment artificially diminished).

Here, the need to distinguish between part-time and full-time workers is not so acute since from Appendix Table 5.1 it can be calculated that, taken over all industrial categories, part-time employees accounted for only 5.8 per cent of the male labour force, in Scotland in 1981. Given the small numbers involved, the distinction between part-time and full-time workers can be ignored for present purposes. Inspection of Tables 5.9 and 5.10 shows that male school leavers and all ages were widely spread across industrial categories, and that their employment was not as concentrated as females'.

There were some noticeable differences between male school leavers' and all ages' industrial distributions of employment. The main differences were that male school leavers' employment was relatively concentrated in the manufacturing industries, in 1977, and relatively under-represented in the service industries, in 1977 and 1981. School leavers' employment was especially concentrated in: Electrical Engineering; Distributive Trades; Public Administration and Defence, and, in 1981, Construction. In the cases of Distributive Trades and Electrical Engineering the relative concentration partly reflected industrial re-classification problems. Male school leavers were

Table 5.9

The percentage of male all ages' employment in each industrial category, with rank, 1977 and 1981

Industrial Category	Percentage		Rank	
	1977	1981	1977	1981
1. Agriculture, Forestry and Fishing	3.47	3.44	10	12
2. Mining and Quarrying	3.10	3.90	11	10
3. Gas, Electricity and Water	1.89	2.10	19	17
4. Metal Manufacturing	2.98	2.22	13	15
5. Bricks, Pottery, Glass and Cement etc	1.25	0.98	21	21
6. Chemicals and Allied Industries	1.96	1.83	18	18
7. Mechanical Engineering	6.38	5.08	7	8
8. Electrical Engineering	2.41	2.55	15	13
9. Shipbuilding, Marine Engineering and Vehicles	5.72	5.10	8	7
10. Instrument Engineering and Metal Goods, NES	2.54	2.19	14	16
11. Food, Drink and Tobacco	4.28	4.35	9	9
12. Textiles	2.19	1.63	17	19
13. Clothing and Footwear, Leather, Leather Goods and Fur	0.51	0.44	23	23
14. Timber, Furniture, etc	1.43	1.34	20	20
15. Paper, Printing and Publishing	2.36	2.29	16	14
16. Other Manufacturing Industries	0.90	0.62	22	22
17. Construction	12.66	11.97	1	1
18. Distributive Trades	7.62	8.52	6	5
19. Miscellaneous Services	7.76	8.71	5	4
20. Transport and Communication	9.11	9.35	2	3
21. Insurance, Banking, Finance and Business Services	3.02	3.61	12	11
22. Public Administration and Defence	7.85	8.07	4	6
23. Professional and Scientific Services	8.61	9.71	3	2

Table 5.10

The percentage of male school leavers in each industrial category, with rank, 1977 and 1981

Industrial Category	Percentage		Rank	
	1977	1981	1977	1981
1. Agriculture, Forestry and Fishing	3.3	4.3	10	11
2. Mining and Quarrying	2.4	1.9	16	12
3. Gas, Electricity and Water	1.1	1.7	20	15
4. Metal Manufacturing	2.6	0.7	12	18
5. Bricks, Pottery, Glass and Cement etc	0.7	0.5	23	19
6. Chemicals and Allied Industries	0.9	0.5	21	19
7. Mechanical Engineering	6.6	5.4	6	6
8. Electrical Engineering	6.2	5.6	7	5
9. Shipbuilding, Marine Engineering and Vehicles	8.5	5.2	5	7
10. Instrument Engineering and Metal Goods, NES	1.2	1.8	19	13
11. Food, Drink and Tobacco	5.3	6.5	8	4
12. Textiles	2.5	0.5	14	19
13. Clothing and Footwear, Leather, Leather Goods and Fur	2.6	0.5	12	19
14. Timber, Furniture, etc	1.8	1.4	18	17
15. Paper, Printing and Publishing	2.0	1.8	17	13
16. Other Manufacturing Industries	0.9	0.7	21	23
17. Construction	12.0	17.0	2	1
18. Distributive Trades	12.2	15.7	1	2
19. Miscellaneous Services	9.2	4.6	3	9
20. Transport and Communication	3.6	4.8	9	8
21. Insurance, Banking, Finance and Business Services	2.8	4.5	11	10
22. Public Administration and Defence	9.1	12.9	4	3
23. Professional and Scientific Services	2.5	1.6	14	16

Source: SEDA op cit.

particularly under-represented in: Professional and Scientific Services (which probably largely reflected industrial re-classification problems); Transport and Communications; Gas, Electricity and Water; Mining and Quarrying; Chemicals and Allied Industries; and, in 1981, in Miscellaneous Services (which probably largely reflected industrial re-classification problems); Textiles, and, Metal Manufacturing. Most of these industrial categories were discussed above.

Both male all ages' and male school leavers' industrial distributions of employment changed quite markedly over the period 1977-81. For both groups, the percentage of their total employment accounted for by the manufacturing industries dropped quite sharply. This was especially so for male school leavers, since the percentage of their total employment accounted for by the manufacturing industries fell by over 10 percentage points; and this decrease was accompanied by a 4.7 percentage point increase in the service industries' share of their total employment; and, a 5 percentage point increase in the Construction industry's share of their total employment. In the case of male all ages, the proportion of their total employment accounted for by the manufacturing industries fell by 4.3 percentage points and this was accompanied by a 5 percentage point increase in the service industries' share of their total employment. In 1981, school leavers' employment was no longer relatively concentrated in the manufacturing industries; though they were still under-represented in services, mainly because the proportion of their total employment in construction increased, unlike male all ages.

The index of dis-similarity figures shown in Table 5.11 indicate that the two group's industrial distributions of employment were becoming increasingly dis-similar between 1977 and 1981, mainly because of the changes in male school leavers' distribution (which to some unknown extent reflected industrial re-classification problems). The Gini coefficients given in Table 5.12 show that

Table 5.11

The index of dis-similarity, male school leavers' and all ages' employment 1977 and 1981

All Ages / School Leavers 1977	1.551
All Ages / School Leavers 1981	2.137
School Leavers 1977 / School Leavers 1981	1.613
All Ages 1977 / All Ages 1981	0.454

Table 5.12

Gini coefficients for the industrial distributions of male school leavers' and all ages' employment, 1977 and 1981

	1977	1981
School Leavers	0.438	0.501
All Ages	0.335	0.358

male school leavers' industrial distribution of employment was considerably more concentrated than male all ages' (in contrast to females) and that both distributions became more concentrated between 1977 and 1981.

5.3.5. Summary

In this section, it was discovered that, school leavers' employment tended to be more concentrated in the manufacturing industries and, obversely, less concentrated in the service industries, than all ages'. Between 1977 and 1981, school leavers and all ages both experienced a shift away from the manufacturing industries; towards the service industries, in the cases of all ages and female school leavers, and, towards the service and construction industries, in the case of male school leavers. These shifts were more pronounced for school leavers.

Between 1977 and 1981, school leavers' and all ages' industrial distributions of employment became less similar largely due to increasing differences between their industrial distributions of employment within the manufacturing and service sectors. However, to some unknown extent this reflected the industrial re-classification problems which affected the figures for school leavers. Also, both groups experienced an increasing concentration of their employment between 1977 and 1981.

Finally, it was claimed that school leavers' under-representation in certain industrial categories was often associated with a history of all ages' employment decline, a high proportion of part-time employees, or, the existence of minimum age regulations. It was also argued that school leavers' over-representation in certain industrial categories was often explicable in terms of the need for initial training and, the fact that school leavers possess significant advantages as trainees, and, also, the fact that school leavers' wage

rates were lower than all ages'. Finally, in certain cases, e.g. Miscellaneous Services, it may also have reflected the industrial re-classification problems associated with the figures for school leavers' employment.

5.4. The Application of the Shift-Share Technique to School Leavers' Absolute Change in Employment 1977-81

5.4.1. Introduction

The aim in this section is to apply the shift-share decomposition to the change in school leavers' employment between 1977 and 1981. The analysis starts with both genders taken together, continues with the analysis for females, followed by that for males, and finishes with a consideration of the effect, on the results of the shift-share decomposition, of taking account of the fact that since the vast majority of school leavers worked full-time the shift-share decomposition is best conducted using the data for all ages' full-time employment only.

5.4.2. Both Genders

The reconstructed figures for school leavers' employment in each industrial category, in 1977 and 1981, are shown alongside those for all ages in Table 5.13. The data in that table provide the raw material for the analysis in this sub-section. By way of a preview to the shift-share analysis, Table 5.14 shows all ages' and school leavers', (both genders' combined), job gains, job losses and net employment change, taken over all industrial categories, between 1977 and 1981. It can be seen from that table that school leavers accounted for 19.1 per cent of the net loss of all age jobs in that period. When one considers that school leavers represented only 3.3 per cent of all age employees in 1977, it will be appreciated that school leavers were especially affected by the recession that started in 1979. In fact, school leavers accounted for 5.8 times

Table 5.13

Reconstructed school leavers' and all ages' industrial distributions of employment compared 1977 and 1981

Industrial Category	1977		1981	
	School Leavers	All Ages	School Leavers	All Ages
1. Agriculture, Forestry and Fishing	1249	48632	1105	44482
2. Mining and Quarrying	773	39015	530	46939
3. Gas, Electricity and Water	476	28401	486	29119
4. Metal Manufacturing	952	39700	177	27282
5. Bricks, Pottery, Glass and Cement etc	297	17319	177	12761
6. Chemicals and Allied Industries	654	31328	265	26920
7. Mechanical Engineering	2380	88264	1282	64380
8. Electrical Engineering	2974	50382	1812	44923
9. Shipbuilding, Marine Engineering and Vehicles	2974	74140	1282	62133
10. Instrument Engineering and Metal Goods, NES	773	44424	530	34487
11. Food, Drink and Tobacco	3093	91644	2343	82329
12. Textiles	2023	58973	530	41063
13. Clothing and Footwear, Leather, Leather Goods and Fur	4581	35286	1812	27627
14. Timber, Furniture, etc	654	20437	354	17881
15. Paper, Printing and Publishing	1249	43977	796	39306
16. Other Manufacturing Industries	595	15966	309	10887
17. Construction	4283	163705	4287	147168
18. Distributive Trades	9756	238756	8707	241883
19. Miscellaneous Services	6663	234211	4155	262169
20. Transport and Communication	1487	133590	1635	127070
21. Insurance, Banking, Finance and Business Services	3569	78196	4022	91275
22. Public Administration and Defence	4521	145883	4774	136576
23. Professional and Scientific Services	3569	348731	2785	371992
TOTAL	59488	2070960	44155	1990652

Source: Scottish Office (all ages' figures)

Table 5.14

Jobs gained, jobs lost and the net change of all ages' employment and school leavers' employment 1977-1981

	School Leavers	All Ages	% of All Ages' Jobs Gains/ Losses/Net Change Accounted for by School Leavers
Jobs Gained	867	76067	1.14
Jobs Lost	16200	156375	10.36
Net Change	-15333	-80308	19.09
Ratio of Gains to Losses	0.05	0.49	

Table 5.15

The Decomposition of the Decline in School Leaver Employment According to the Source of Employment Loss, All Industries, 1977-81

		Number	%
A	That part due to the overall effect of the decline in Total All Ages' Employment	2277	14.8
B	That part due to the concentration of school leavers' employment in badly hit industries	1111	7.2
C	That part due to a decline in the recruitment ratio	12004	78.0
	Total	15392	100.0

as many all age net job losses as they would have been expected to if their employment had fallen in the same proportion as all ages'. It can be seen from the table that this was because school leavers accounted for over 10 per cent of all ages' total job losses and only 1.1 per cent of their job gains.

Turning now to the results of the shift-share analysis, Table 5.15 shows, for all the industrial categories taken together, the decomposition of the net change in school leavers' employment into the three components.[6] It can be seen from that table that nearly four-fifths (78.0 per cent) of school leavers' net employment loss can be attributed to the decline in industry's recruitment ratios. Only 7.2 per cent of the loss can be attributed to structural change. The remaining part of the loss (14.8 per cent) can be attributed to the the decline in all ages' total employment. So, it can be seen that by far the major source of school leavers' net decline in employment, between 1977 and 1981, was the decline in their recruitment.[7]

Table 5.16 shows school leavers' absolute employment change decomposed into the three components for each industrial category separately. The labels, "A", "B" and "C" relate, from here on, to that part of school leavers' net employment decline attributable to the decline in all ages' total employment, that part attributable to structural change, and, that part attributable to the decline in industry's recruitment ratios, respectively. From the table it can be seen that the experiences of individual industrial categories were a lot more diverse than the aggregate analysis might suggest. As noted in Section 5.2.2, one faces a potential loss of important information if one does not provide figures showing the shift-share decomposition for each industrial category separately, because the proportion of the decline in school leavers' *total* employment accounted for by the decline in recruitment ratios is not independent of their initial industrial distribution of employment.

Table 5.16

The decomposition of school leavers' absolute employment change 1977–1981 into the three components

Industrial Category	COMPONENTS		
	A	B	C
1. Agriculture, Forestry and Fishing	48	59	38
2. Mining and Quarrying	30	-187	400
3. Gas, Electricity and Water	18	-30	2
4. Metal Manufacturing	36	261	477
5. Bricks, Pottery, Glass and Cement etc	11	67	42
6. Chemicals and Allied Industries	25	67	297
7. Mechanical Engineering	91	553	454
8. Electrical Engineering	114	209	840
9. Shipbuilding, Marine Engineering and Vehicles	114	368	1211
10. Instrument Engineering and Metal Goods, NES	30	143	70
11. Food, Drink and Tobacco	118	196	436
12. Textiles	77	537	878
13. Clothing and Footwear, Leather, Leather Goods and Fur	175	819	1774
14. Timber, Furniture, etc	25	57	219
15. Paper, Printing and Publishing	48	85	321
16. Other Manufacturing Industries	23	166	96
17. Construction	164	269	-437
18. Distributive Trades	373	-501	1177
19. Miscellaneous Services	255	-1050	3303
20. Transport and Communication	57	16	-221
21. Insurance, Banking, Finance and Business Services	137	-733	144
22. Public Administration and Defence	173	116	-541
23. Professional and Scientific Services	137	-375	1023
TOTAL	2277	1111	12004

*Negative figures represent job gains

The effects of industrial re-classification problems will show themselves in the distribution of school leavers' recruitment ratio effect across industrial categories. The other two components will be unaffected since they depend on the prior period's recruitment ratios and all ages' employment only. Industrial re-classification problems will not therefore alter the size of each of the three components taken across all industrial categories.

It can be seen from Table 5.16 that the net effect of the change in all ages' employment in each industrial category, i.e. the component due to the decline in all ages' total employment combined with the structural component, should have led to job gains for school leavers in: Mining and Quarrying etc.; Gas, Electricity and Water; Distributive Trades; Miscellaneous Services, and, Professional and Scientific Services. As it was, the negative employment effect of the decline in these industry's recruitment ratios was sufficient to overwhelm the positive net employment effect of the change in all ages' employment. In the cases of Construction, and, Transport and Communication, the increase in the recruitment ratio resulted in job gains for school leavers.

Table 5.17 shows the percentage of the change in school leavers' employment in each industrial category accounted for by the three components. It can be seen from that table that only nine manufacturing industries displayed the same pattern as the aggregate analysis, i.e. the component attributable to the decline in recruitment ratios being the largest component, followed by the component attributable to the decline in all ages' total employment, and, finally, the structural component. These manufacturing industries were: Metal Manufacturing; Chemicals and Allied Industries; Electrical Engineering; Shipbuilding, Marine Engineering and Vehicles; Food, Drink and Tobacco; Textiles; Clothing and Footwear etc; Timber, Furniture etc; and, Paper, Printing and Publishing. Among the other manufacturing industries the

Table 5.17

The percentage of school leavers' employment change 1977-1981, accounted for by the three components*

Industrial Category	COMPONENTS		
	A	B	C
1. Agriculture, Forestry and Fishing	33.1	40.8	26.1
2. Mining and Quarrying	12.2	-76.8	164.6
3. Gas, Electricity and Water	-176.9	293.9	-17.0
4. Metal Manufacturing	4.7	33.7	61.6
5. Bricks, Pottery, Glass and Cement etc	9.4	55.5	35.1
6. Chemicals and Allied Industries	6.4	17.2	76.3
7. Mechanical Engineering	8.3	50.4	41.3
8. Electrical Engineering	9.8	17.9	72.3
9. Shipbuilding, Marine Engineering and Vehicles	6.7	21.7	71.5
10. Instrument Engineering and Metal Goods, NES	12.2	59.0	28.8
11. Food, Drink and Tobacco	15.8	26.1	58.1
12. Textiles	5.2	36.0	58.8
13. Clothing and Footwear, Leather, Leather Goods and Fur	6.3	29.6	64.1
14. Timber, Furniture, etc	8.3	18.9	72.8
15. Paper, Printing and Publishing	10.5	18.7	70.8
16. Other Manufacturing Industries	8.0	58.3	33.7
17. Construction	-3915.3	-6426.8	10442.1
18. Distributive Trades	35.6	-47.8	112.2
19. Miscellaneous Services	10.2	-41.9	131.7
20. Transport and Communication	-38.4	-10.6	149.0
21. Insurance, Banking, Finance and Business Services	-30.1	162.0	-31.8
22. Public Administration and Defence	-68.5	45.8	214.3
23. Professional and Scientific Services	17.4	-47.7	130.3
TOTAL	14.8	7.2	78.0

* Negative figures relate to job gains

structural component was largest.

Finally, among the service industries, some industrial categories reduced school leavers' employment whilst all ages' employment increased; these categories were: Distributive Trades, Miscellaneous Services, and, Professional and Scientific Services. In the case of Distributive Trades industrial re-classification problems probably reduced the recruitment ratio effect, whilst in the case of Professional and Scientific Services they probably increased it. School leavers' employment in Insurance, Banking, Finance and Business Services, only increased because the positive effect of the increase in all ages' employment more than offset the decline in the recruitment ratio.

5.4.3. Females

The reconstructed figures for female school leavers' employment, in each industrial category, are shown along with those for all ages' employment in Table 5.18. Table 5.19, using the figures in Table 5.18, shows all ages' and school leavers' net employment change, job gains and losses, and the percentage of all ages' net employment change, job gains and losses accounted for by school leavers. It can be seen from the table that school leavers apparently accounted for 21 times the net change in all ages' employment. This extraordinary result partly stems from the fact that school leavers were particularly affected by full-time job losses and did not participate in all ages' part-time job gains; however, part-time employment growth cannot, as we shall see, account for the entire differential in job losses between female all ages and school leavers.

Turning to the results of the shift-share analysis, Table 5.20 shows, for all the industrial categories combined, the decomposition of the decline in female school leavers' employment into the three components. From that table it can

Table 5.18

Female school leavers and all ages' industrial distributions of employment, 1977 and 1981

Industrial Category	1977		1981	
	School Leavers	All Ages	School Leavers	All Ages
1. Agriculture, Forestry and Fishing	193	7090	126	6027
2. Mining and Quarrying	28	1884	84	3351
3. Gas, Electricity and Water	166	5720	126	5590
4. Metal Manufacturing	110	3998	21	2483
5. Bricks, Pottery, Glass and Cement etc	83	2358	42	1791
6. Chemicals and Allied Industries	331	7870	126	6418
7. Mechanical Engineering	221	11762	105	7571
8. Electrical Engineering	966	21487	546	16453
9. Shipbuilding, Marine Engineering and Vehicles	193	5553	84	5128
10. Instrument Engineering and Metal Goods, NES	386	13980	126	9997
11. Food, Drink and Tobacco	1408	40341	840	33741
12. Textiles	1215	32730	399	22786
13. Clothing and Footwear, Leather, Leather Goods and Fur	3864	29181	1700	22749
14. Timber, Furniture, etc	83	3295	42	2913
15. Paper, Printing and Publishing	607	15719	378	13708
16. Other Manufacturing Industries	304	5140	168	3913
17. Construction	386	12073	357	13307
18. Distributive Trades	5907	147451	5059	146610
19. Miscellaneous Services	3726	141288	3044	164792
20. Transport and Communication	304	24486	504	22504
21. Insurance, Banking, Finance and Business Services	2733	41977	2981	50913
22. Public Administration and Defence	1573	51808	1784	46329
23. Professional and Scientific Services	2816	245604	2372	263403
TOTAL	27603	872795	21012	872477

Source: Scottish Office for All Ages' figures

Table 5.19

Jobs gained, jobs lost and the net change in employment of females all ages and school leavers 1977-1981

	School Leavers	All Ages	% of All Ages' Jobs Gains/ Losses/Net Change Accounted for by School Leavers
Jobs Gained	715	52940	0.01
Jobs Lost	7306	53258	0.14
Net Change	-6591	-318	20.73
Ratio of Gains to Losses	0.10	0.99	

Table 5.20

The decomposition of the decline in female school leavers' employment according to the source of employment loss, All Industries, 1977-81*

Components	Number of Job Losses Accounted for by Each Component	% of Employment Decline Accounted for by Each Component
A	10	0.2
B	944	14.3
C	5637	85.5
Total Employment Change	-6591	100

be seen that 86 per cent of female school leavers' employment decline between 1977 and 1981 can be attributed to the decline in industry's gender specific recruitment ratios. Just over 14 per cent can be attributed to structural change and only 0.2 per cent of the decline can be attributed to the overall effect of the decline in female all ages' total employment.

These results should be treated with caution. One effect of the growth in all ages' part-time employment will have been to increase the proportion of female school leavers' total employment decline allocated to the decline in industry's recruitment ratios. Consequently, the proportion of their employment decline allocated to the decline in female all ages' total employment will be diminished.

Although the need to distinguish between part-time and full-time employment has become obvious here, the need was not so obvious when the aggregate analysis, using data for both genders taken together was undertaken above. However, the above noted problems still existed and the failure to draw a distinction between full-time and part-time employment may have led to misleading results. This issue is further addressed in subsection 5.4.5.

Table 5.21 shows the absolute number of female school leavers' job losses and gains accounted for by each of the three components, in each industrial category. Table 5.22 shows the percentage of female school leavers' net employment change accounted for by each of the three components in each industrial category. The information contained in Tables 5.21 and 5.22 indicates that the results of the aggregate analysis hide a great deal of industrial diversity. The industrial categories which matched the picture painted by the aggregate analysis were mainly, though not exclusively, manufacturing industries, i.e. Agriculture, Forestry and Fishing; Mining and Quarrying; Gas,

Table 5.21

The decomposition of the change in female school leavers' employment, 1977-1981, according to source

Industrial Category	COMPONENTS		
	A	B	C
1. Agriculture, Forestry and Fishing	0	29	38
2. Mining and Quarrying	0	-22	-35
3. Gas, Electricity and Water	0	4	36
4. Metal Manufacturing	0	42	48
5. Bricks, Pottery, Glass and Cement etc	0	20	21
6. Chemicals and Allied Industries	0	61	144
7. Mechanical Engineering	0	79	37
8. Electrical Engineering	0	226	194
9. Shipbuilding, Marine Engineering and Vehicles	0	15	94
10. Instrument Engineering and Metal Goods, NES	0	110	150
11. Food, Drink and Tobacco	1	230	338
12. Textiles	0	369	447
13. Clothing and Footwear, Leather, Leather Goods and Fur	1	850	1312
14. Timber, Furniture, etc	0	10	31
15. Paper, Printing and Publishing	0	77	152
16. Other Manufacturing Industries	0	72	63
17. Construction	0	-40	69
18. Distributive Trades	2	32	815
19. Miscellaneous Services	1	-621	1303
20. Transport and Communication	0	24	-225
21. Insurance, Banking, Finance and Business Services	1	-583	334
22. Public Administration and Defence	1	166	-377
23. Professional and Scientific Services	1	-205	648
TOTAL	10	944	5637

Columns may not sum to totals, due to rounding

Table 5.22

The decomposition of the decline in female school leavers' employment, 1977-1981, percentages

Industrial Category	COMPONENTS		
	A	B	C
1. Agriculture, Forestry and Fishing	0.1	43.0	56.9
2. Mining and Quarrying	0.0	38.2	61.9
3. Gas, Electricity and Water	0.2	9.3	90.5
4. Metal Manufacturing	0.0	46.7	53.2
5. Bricks, Pottery, Glass and Cement etc	0.1	48.7	51.2
6. Chemicals and Allied Industries	0.1	29.7	70.2
7. Mechanical Engineering	0.1	67.8	32.1
8. Electrical Engineering	0.1	53.8	46.2
9. Shipbuilding, Marine Engineering and Vehicles	0.1	13.5	86.5
10. Instrument Engineering and Metal Goods, NES	0.1	42.2	57.7
11. Food, Drink and Tobacco	0.1	40.4	59.5
12. Textiles	0.1	45.2	54.8
13. Clothing and Footwear, Leather, Leather Goods and Fur	0.1	39.3	60.6
14. Timber, Furniture, etc	0.1	23.4	76.5
15. Paper, Printing and Publishing	0.1	33.8	66.1
16. Other Manufacturing Industries	0.1	53.3	46.6
17. Construction	0.5	-133.9	233.4
18. Distributive Trades	0.3	3.7	96.0
19. Miscellaneous Services	0.2	-91.0	190.8
20. Transport and Communication	0.1	-12.2	112.3
21. Insurance, Banking, Finance and Business Services	0.4	235.0	-134.6
22. Public Administration and Defence	0.3	-78.7	178.9
23. Professional and Scientific Services	0.2	-46.2	146.0
TOTAL	0.2	14.3	85.5

Electricity and Water; Metal Manufacturing; Bricks, Pottery etc.; Chemicals and Allied Industries; Shipbuilding etc.; Instrument Engineering and Metal Goods NOS.; Food, Drink and Tobacco; Textiles; Clothing, Footwear etc., TImber, Furniture etc.; Paper, Printing and Publishing; and Distributive Trades. The structural component was the largest component in the case of the remaining manufacturing industries, i.e. Mechanical Engineering; Electrical Engineering and, Other Manufacturing Industries.

Finally, amongst the service industries, the decline in recruitment ratios added to the decline in school leavers' employment in Miscellaneous Services, and, Professional and Scientific Services, and helped to partially offset the increase in their employment in Insurance, Banking, Finance and Business Services. In the case of Professional and Scientific Services industrial re-classification problems probably added to the decline in the recruitment ratio whilst in the case of Insurance, Banking, Finance and Business Services they probably helped offset it. An increase in the recruitment ratio helped to increase school leavers' employment in the remaining service industries, i.e. Transport and Communication, and, Public Administration and Defence.

5.4.4. Males

The reconstructed figures for male school leavers' employment, in each industrial category, are shown along with those for all ages' employment in Table 5.23. Table 5.24, using the figures in Table 5.23, shows male all ages' and school leavers' net employment change, job gains and losses; and the percentage of all ages' net employment change, job gains and losses accounted for by male school leavers. It can be seen from that table that school leavers accounted for nearly 11 per cent of the net decline in male all ages' employment. This resulted from the fact that school leavers accounted for nearly 9 per cent of male all ages' job losses and only 1.7 per cent of male

Table 5.23

Male school leavers' and all ages' industrial distributions of employment in 1977 and 1981

Industrial Category	1977		1981	
	School Leavers	All Ages	School Leavers	All Ages
1. Agriculture, Forestry and Fishing	1055	41542	999	38455
2. Mining and Quarrying	767	37131	442	43588
3. Gas, Electricity and Water	352	22681	395	23529
4. Metal Manufacturing	831	35702	163	24799
5. Bricks, Pottery, Glass and Cement etc	224	14961	116	10970
6. Chemicals and Allied Industries	288	23458	116	20502
7. Mechanical Engineering	2110	76502	1255	56809
8. Electrical Engineering	1983	28895	1301	28470
9. Shipbuilding, Marine Engineering and Vehicles	2718	68587	1208	57005
10. Instrument Engineering and Metal Goods, NES	384	30444	418	24490
11. Food, Drink and Tobacco	1695	51303	1510	48588
12. Textiles	799	26243	116	18277
13. Clothing and Footwear, Leather, Leather Goods and Fur	831	6105	116	4878
14. Timber, Furniture, etc	576	17142	325	14968
15. Paper, Printing and Publishing	640	28258	418	25598
16. Other Manufacturing Industries	288	10826	163	6974
17. Construction	3837	151632	3950	133861
18. Distributive Trades	3901	91305	3648	95273
19. Miscellaneous Services	2942	92923	1069	97377
20. Transport and Communication	1151	109104	1115	104566
21. Insurance, Banking, Finance and Business Services	895	36219	1046	40362
22. Public Administration and Defence	2910	94075	2998	90247
23. Professional and Scientific Services	799	103127	372	108589
TOTAL	31976	1198165	23260	1118175

Source All Ages' figures: Scottish Office

Table 5.24

Jobs gained, jobs lost and the net change in employment of males all ages and school leavers, 1977-1981

	School Leavers	All Ages	% of All Ages' Jobs Gains/ Losses/Net Change Accounted for by School Leavers
Jobs Gained	429	25332	1.69
Jobs Lost	9145	105322	8.68
Net Change	-8716	-79990	10.90
Ratio of Gains to Losses	0.05	0.24	

Table 5.25

The decomposition of the decline in male school leavers' employment loss according to the source of employment loss, all industries, 1977-81

Components	Number of Job Losses Accounted for by Each Component	% of Employment Decline Accounted for by Each Component
A	2135	24.5
B	149	1.7
C	6432	73.8
Total Employment Change	-8716	100

all ages' job gains.

Table 5.25 shows, for all the industrial categories taken together, the decomposition of the decline in male school leavers' employment into the three components. From that table it can be seen that nearly 74 per cent of male school leavers' net employment decline can be attributed to the decline in industry's gender-specific recruitment ratios. Just under 25 per cent can be attributed to the overall effect of the decline in male all ages' total employment, and only 1.7 per cent can be attributed to structural change.

Table 5.26 shows the number of male school leavers' job losses and gains accounted for by each of the three components, in each industrial category. Table 5.27 shows the percentage of male school leavers' net employment change accounted for by each of the three components in each industrial category. From these tables it can be seen that the industrial categories which mirrored the picture painted by the aggregate analysis were all manufacturing industries, i.e. Metal Manufacturing; Bricks, Pottery etc.; Chemicals and Allied Industries; Shipbuilding etc; Textiles; Clothing and Footwear etc; Timber, Furniture etc; and, Paper, Printing and Publishing. In the cases of Mechanical Engineering and Other Manufacturing Industries the structural component was largest. The decline in the recruitment ratio added to the decline in school leavers' employment in: Electrical Engineering, and, Food, Drink and Tobacco. In the remaining manufacturing industry: Instrument Engineering and Metal Goods NES., a rise in the recruitment ratio led to a rise in school leavers' employment. In the cases of Mechanical and Electrical Engineering industrial re-classification problems probably offset the decline in recruitment ratios.

Amongst the service industries, the decline in recruitment ratios overwhelmed the effect of the increase in all ages' employment and resulted in

Table 5.26

The decomposition of the decline in male school leavers' employment according to the source of job loss, 1977-81

Industrial Category	COMPONENTS		
	A	B	C
1. Agriculture, Forestry and Fishing	70	8	-22
2. Mining and Quarrying	51	-185	459
3. Gas, Electricity and Water	23	-37	-30
4. Metal Manufacturing	56	198	415
5. Bricks, Pottery, Glass and Cement etc	15	45	48
6. Chemicals and Allied Industries	19	17	135
7. Mechanical Engineering	141	402	312
8. Electrical Engineering	132	-103	652
9. Shipbuilding, Marine Engineering and Vehicles	181	278	1051
10. Instrument Engineering and Metal Goods, NES	26	49	-110
11. Food, Drink and Tobacco	113	-23	95
12. Textiles	53	189	441
13. Clothing and Footwear, Leather, Leather Goods and Fur	56	112	548
14. Timber, Furniture, etc	38	35	177
15. Paper, Printing and Publishing	43	18	161
16. Other Manufacturing Industries	19	83	23
17. Construction	256	194	-563
18. Distributive Trades	260	-430	422
19. Miscellaneous Services	196	-337	2014
20. Transport and Communication	77	-29	-12
21. Insurance, Banking, Finance and Business Services	60	-162	-48
22. Public Administration and Defence	194	-76	-206
23. Professional and Scientific Services	53	-96	470
ALL INDUSTRIES	2135	149	6432

Table 5.27

The decomposition of the decline in male school leavers' employment according to the source of job loss, percentages, 1977-1981

Industrial Category	COMPONENTS		
	A	B	C
1. Agriculture, Forestry and Fishing	125.7	14.2	-40.0
2. Mining and Quarrying	15.7	-56.7	140.9
3. Gas, Electricity and Water	-54.2	84.6	69.6
4. Metal Manufacturing	8.3	29.7	62.0
5. Bricks, Pottery, Glass and Cement etc	13.9	41.6	44.5
6. Chemicals and Allied Industries	11.2	9.9	78.9
7. Mechanical Engineering	16.5	47.0	36.5
8. Electrical Engineering	19.4	-15.1	95.7
9. Shipbuilding, Marine Engineering and Vehicles	12.0	18.4	69.6
10. Instrument Engineering and Metal Goods, NES	-74.1	-143.1	317.2
11. Food, Drink and Tobacco	61.4	-12.7	51.3
12. Textiles	7.8	27.7	64.5
13. Clothing and Footwear, Leather, Leather Goods and Fur	7.8	15.6	76.6
14. Timber, Furniture, etc	15.4	13.8	70.8
15. Paper, Printing and Publishing	19.3	7.9	72.8
16. Other Manufacturing Industries	15.4	66.5	18.2
17. Construction	-226.4	-171.0	497.4
18. Distributive Trades	103.0	-170.0	167.0
19. Miscellaneous Services	10.5	-18.0	107.5
20. Transport and Communication	214.9	-81.0	-33.9
21. Insurance, Banking, Finance and Business Services	-39.8	107.9	31.9
22. Public Administration and Defence	-221.4	86.5	234.9
23. Professional and Scientific Services	12.5	-22.4	109.9
ALL INDUSTRIES	24.5	1.7	73.8

a decline in school leavers' employment in: Distributive Trades; Miscellaneous Services; and, Professional and Scientific Services. In the case of Distributive Trades industrial re-classification problems probably helped offset the decline in the recruitment ratio whilst in the case of Miscellaneous Services they probably added to the decline in the recruitment ratio. In the remaining service industries, the recruitment ratio increased. In Insurance, Banking, Finance and Business Services, and, Public Administration and Defence, the increase in the recruitment ratio augmented the effect of an increase in all ages' employment and helped to produce an increase in school leavers' employment. In the case of Transport and Communication it was not sufficient to offset the decline in all ages' employment.

Finally, in Construction, the increase in the recruitment ratio more than offset the decline in all ages' employment to produce an increase in school leavers' employment.

5.4.5. The Use of All Ages' Full-time Employment Figures Only in the Application of the Shift-Share Technique

The aim in this sub-section is to examine the suggestion, made in sub-section 5.4.3, that the use of figures relating to combined all ages' full and part-time employment caused problems when applying the shift-share decomposition to the net change in school leavers' employment. Specifically, it was suggested that it would cause an over-estimation of the role played by the decline in industry's recruitment ratios and an under-estimation of the role played by the decline in all ages' total employment. These problems arise from two sources; firstly, the fact that school leavers rarely take part-time jobs and, secondly, the fact that the net change in all ages' total employment over the period 1977-81, was the net result of two opposing trends: an increase in female all ages' part-time employment and a decrease in both gender's all

ages' full-time employment.

Evidence to support the first assertion is contained in Table 5.28, which shows the percentage of educationally qualified school leavers reporting themselves in part-time employment in 1979. The figures have to be limited to educationally qualified school leavers in 1979 since they were the only group asked this question and this is the only survey in which this question was asked (between 1977 and 1983). The figures in Table 5.28 show that, amongst qualified school leavers in 1979, only a minute fraction, i.e. 0.6 per cent of those employed, reported themselves as being in part-time employment. The reported percentage was slightly higher for males, 0.9 per cent, than for females, 0.4 per cent.

Evidence to support the second assertion is contained in Table 5.29, which shows the change in all ages' employment, between 1977 and 1981, broken down into its full and part-time components for each gender separately and both genders taken together. The figures in the table show that, both genders' full-time employment declined and part-time employment increased and that, in the case of female all ages, the two counteracting trends almost cancelled each other out.

Turning to the consideration of the biases Table 5.30(a) shows the results of performing the shift-share decomposition for male and female school leavers separately and for both genders taken together, using figures relating to all ages' full-time employment only. Table 5.30(b) shows the figures discussed in sub-sections 5.4.2, 5.4.3 and 5.4.4. In the case of both genders taken together, it can be seen from comparing both parts of Table 5.30 that the effect of using the data relating to all ages' full-time employment alone is to increase the proportion of school leavers' net employment change attributed to

Table 5.28

The percentage of qualified school leavers in employment working part-time, 1979

	%
Males	0.9
Females	0.4
Both Sexes	0.6

Source: SEDA 1979

Table 5.29

The change in male and female all ages full and part-time employment 1977-81

	Full Time	Part Time	Full and Part Time
Males	-83427	+3437	-79990
Females	-26633	+26315	-318
Both Sexes	-110060	+29752	-80308

Table 5.30

The decomposition of school leavers' employment decline into three components, males and females, 1977-1981, using full-time all ages' only and full and part-time combined all ages' figures

A. Full-Time All Ages Only

Components	Both Sexes	%	Females	%	Males	%
A	3848	25.0	1310	19.9	2336	26.8
B	402	2.6	528	8.0	113	1.3
C	11142	72.4	4753	72.1	6267	71.9
Total	15392	100.0	6591	100.0	8716	100.0

B. Full and Part-Time All Ages

Components	Both Sexes	%	Females	%	Males	%
A	2277	14.8	10	0.2	2135	24.5
B	1111	7.2	944	14.3	149	1.7
C	12004	78.0	5637	85.5	6432	73.8
Total	15392	100.0	6591	100.0	8716	100.0

the change in all ages' total employment and to reduce the proportions accounted for by the decline in industry's recruitment ratios and structural change. However, the basic story remains the same: the largest part of school leavers' net employment decline is attributed to the decline in industry's recruitment ratios, the next largest component is attributed to the decline in all ages' total employment, and, structural change is seen to be of minor importance.

As predicted in sub-section 5.4.3, in the case of female school leavers, the differences between the figures shown in the two parts of Table 5.30 are more dramatic than for both genders taken together or for male school leavers alone. The proportion of female school leavers' net employment decline attributed to the net decline in all ages' total employment is 0.2 per cent when all ages' combined full and part-time employment figures are used, and, 19.9 per cent when only all ages' full-time employment figures are used. The difference between the proportion of female school leavers' net employment decline attributed to structural change is also quite dramatic, the proportions being 14.3 per cent when using all ages' combined full and part-time employment figures and 8.0 per cent, when using figures relating to all ages' full-time employment alone. Finally, the proportion attributed to the decline in recruitment ratios is 85.5 per cent when all ages' combined full and part-time figures are used, and 72.1 per cent when figures relating to all ages' full-time employment alone are used. In contrast, the differences between the two sets of figures are quite small for male school leavers.

One effect of using figures relating to full-time all ages' employment only, is to make the results for male and female school leavers become more similar; which is as might be expected since more all age females than all age males worked part-time. One difference that does remain between the results

for each gender, though, is the greater importance of structural change as a source of job losses for female school leavers. This is a reflection of the fact that female school leavers' employment was, initially, more concentrated in the manufacturing industries, compared to female all ages' employment, than was male school leavers' employment, compared to male all ages' employment. The majority of female school leavers' job losses attributed to structural change were, in fact, accounted for by just one industrial category: Clothing and Footwear etc.

5.4.6. Summary

The results of the shift-share analysis are quite clear: the majority of school leavers' net decline in employment, between 1977 and 1981, can be attributed to the decline in industry's recruitment ratios, i.e. the peculiar vulnerability of school leavers' employment in a time of recession. The decline in all ages' total employment contributed a smaller number of job losses. And, only a small part of school leavers' employment decline can be attributed to structural causes.

There were considerable differences between industrial categories in the relative importance of the three components of school leavers' net employment decline. The manufacturing industries were the closest, in the ranking of the three components, to the picture painted by the aggregate analysis. However, the decline in recruitment ratios was not confined to ailing industries, the recruitment ratio declined even in service industries in which all ages' employment increased; though in some cases, e.g. Miscellaneous Services, this may have partly reflected industrial re-classification problems.

Finally, it was found that when applying the shift-share decomposition to the net decline in female school leavers' employment, it is important to

compare like with like and to use figures relating to full-time all ages' employment only; otherwise, the results may be misleading since the recruitment ratio component will be exaggerated at the expense of the components attributable to structural change and the decline in all ages' total employment.

5.5. Comparing All Ages' and School Leavers' Industrial Distributions of Employment in 1979 and 1983

5.5.1. Introduction

The aim in this section is to move the time-frame of analysis on from 1977-81 to 1979-83. Unfortunately, the analysis in this part of the Chapter cannot be as detailed as that contained in the previous parts due to the lack of detailed information on the industrial distribution of all ages' employment in 1979 and 1983. The only available data is limited to both genders taken together, full and part-time employment taken together, and fourteen industrial categories. The source of this data, a discussion of its limitations and an account of the relationship between the new industrial classification, the old one and the 1968 and 1980 SIC's is provided in Appendix 5.1, along with the titles of the fourteen industrial categories. Another difference between the analysis for the period 1977 to 1981 and that here is that the SEDA data now relate to the whole of Scotland, rather than just to the four regions of Tayside, Fife, Strathclyde and Lothian. The data used below are still restricted to those who attended state sector schools, because the sampling arrangements for leavers from other schools were felt to be unsatisfactory in 1979.

The all ages' data for 1979 has been re-classified to the 1980 SIC. Since this re-classification would have made use of the appropriate conversion matrices the situation here is the same as it was in the analysis for 1977-81:

the school leaver data will be affected by re-classification problems but not the all ages' data.

5.5.2. School Leavers' and All Ages' Industrial Distribution of Employment Compared, 1979 and 1983

Tables 5.31 and 5.32 show the percentage of all ages' and school leavers' total employment, respectively, in each of the fourteen industrial categories. It can be seen from comparing Tables 5.31 and 5.32 that the main differences between the two groups' industrial distributions of employment were that school leavers' employment was more concentrated in the manufacturing industries than all ages', and that all ages' employment was more concentrated in the service industries than school leavers'. Between 1979 and 1983, both school leavers and all ages experienced a relative shift away from the manufacturing industries, which largely resulted from the particularly severe difficulties experienced by the manufacturing industries in this period. All ages also experienced a shift away from the construction industry, whereas school leavers experienced a shift towards it. All ages experienced a larger shift towards the service industries than school leavers.[8] This difference of experience in the service industries may have reflected the inability of school leavers to benefit from the relatively buoyant demand for part-time employment in these industries.

Turning to individual industrial categories, using the results concerning industrial re-classification problems contained in Table A2.1 in Appendix 2.4, it can be calculated that, using the present fourteen category industrial classification, the following industrial categories had their percentage of school leavers' employment change by more than one percentage point: Engineering, Vehicles, Shipbuilding and Metal Goods NES (+1.3 percentage points); Distributive Trades (+2.2 percentage points); Public Administration and Defence

Table 5.31

The percentage of all ages' employment in each industrial category, with rank, 1979 and 1983

Industrial Category	Percentage		Rank	
	1979	1983	1979	1983
1. Agriculture, Forestry and Fishing	2.3	2.3	10	11
2. Mining, Quarrying; Coal & Petroleum Products	2.2	2.5	11	10
3. Chemicals and Allied Industries	1.5	1.3	13	13
4. Food, Drink and Tobacco	4.3	3.9	8	7
5. Metal Manufacture	1.6	1.1	12	14
6. Engineering; Vehicles; Shipbuilding & Metal Goods Nes	12.1	9.6	2	3
7. Textiles; Leather, Clothing and Footwear	4.2	3.1	9	9
8. Bricks, Pottery etc; Timber, Furniture etc; Paper, Printing and Publishing, & Other Manuf Industries	4.6	3.8	7	8
9. Construction	7.8	6.4	4	6
10. Gas, Electricity and Water	1.4	1.4	14	12
11. Transport & Communication	6.4	6.5	6	5
12. Distributive Trades	11.8	13.0	3	2
13. Insurance, Banking, Finance and Business Services; Professional and Scientific Services; & Misc Services	33.0	37.2	1	1
14. Public Administration and Defence	6.9	7.9	5	4

Table 5.32

The percentage of school leavers' employment in each industrial category, with rank, 1979 and 1983

Industrial Category	Percentage		Rank	
	1979	1983	1979	1983
1. Agriculture, Forestry and Fishing	3.0	4.7	9	7
2. Mining, Quarrying; Coal & Petroleum Products	1.5	0.9	11	11
3. Chemicals and Allied Industries	1.0	0.7	12	13
4. Food, Drink and Tobacco	5.4	4.1	7	9
5. Metal Manufacture	1.0	0.6	12	14
6. Engineering; Vehicles; Shipbuilding & Metal Goods Nes	12.8	12.5	3	3
7. Textiles, Leather, Clothing and Footwear	7.4	4.7	6	7
8. Bricks, Pottery etc; Timber, Furniture etc; Paper, Printing and Publishing, and Other Manuf Industries	4.6	5.0	8	6
9. Construction	8.8	10.5	5	4
10. Gas, Electricity and Water	1.0	0.9	12	11
11. Transport and Communication	2.8	3.4	10	10
12. Distributive Trades	16.2	18.5	2	2
13. Insurance, Banking, Finance & Business Services; Professional and Scientific Services; & Misc Services	25.5	24.8	1	1
14. Public Administration and Defence	8.9	8.8	4	5

Source: SEDA op cit.

(+1.1 percentage points); and, the combined services category, category 13 (-1.8 percentage points). From Tables 5.31 and 5.32 it can be seen that school leavers' employment was particularly concentrated, relative to all ages', in: Agriculture, Forestry and Fishing; Construction (which was partly due to re-classification problems); Distributive Trades; Public Administration and Defence (which was partly due to re-classification problems); Textiles (in 1979), Clothing and Footwear etc., and (in 1983), Engineering, Vehicles, Shipbuilding and Metal Goods NES (which was partly due to industrial re-classification problems). School leavers' employment was relatively under-represented in: Mining and Quarrying etc.; Chemicals and Allied Industries; Transport and Communication; and the combined services industry category, category 13 (which partly reflected industrial re-classification problems).

Most of the industrial categories referred to above as being school leaver intensive, or their equivalents, were discussed in sub-section 5.3.2; the sole exception being Agriculture, Forestry and Fishing. This industry is traditionally a low paying, male-dominated industry and may therefore be expected to contain a relatively high proportion of male school leavers, since the low wages paid may be expected to be more attractive to young men with no family commitments than to older men with family commitments. Also, the European Economic Community's Common Agricultural Policy will have protected the agricultural component of this industrial category from sizeable fluctuations in the demand for its products and therefore spared it the effects of the recession that started in 1979.

Table 5.33 shows the index of dis-similarity figures for the two distributions in the two years and it can be seen from them that the two groups' industrial distributions of employment became less similar between 1979 and 1983. This reflected changes in both distributions, rather than primarily changes in school

Table 5.33

The index of dis-similarity, school leavers' and all ages' employment 1979 and 1983

	Index
All Ages/School Leavers 1979	1.89
All Ages/School Leavers 1983	2.68
All Ages 1979/All Ages 1983	0.98
School Leavers 1979/School Leavers 1983	0.9

Table 5.34

Gini coefficients for the industrial distributions of school leavers' and all ages' employment, 1979 and 1983

	1979	1983
School Leavers	0.492	0.508
All Ages	0.491	0.529

leavers' industrial distribution of employment, as was the case between 1977 and 1981. As in the period 1977–81, however, some of the changes in school leavers' industrial distribution of employment between 1979 and 1983 reflected industrial re-classification problems.

Table 5.34 shows the Gini coefficients relating to the two group's industrial distributions of employment, in 1979 and 1983, and it can be seen from the coefficients that in 1979 both group's employment was about equally concentrated. In 1983, however, all ages' employment had become more concentrated than school leavers'; this reflected the growing concentration of all ages' employment in the service industries.

To summarise the above, the main common change in school leavers' and all ages' industrial distributions of employment, over the period 1979 to 1983, was a relative shift away from the manufacturing industries toward the service industries. The two main differences between the shifts experienced by school leavers and all ages were: firstly, that the relative shift towards the service industries was greater for all ages than for school leavers, and, secondly, that school leavers experienced a sizeable relative shift towards the Construction industry, whereas all ages experienced a relative shift away from that industry.

5.6. The Application of the Shift–Share Technique to School Leavers' Absolute Change in Employment 1979–83

Table 5.35 shows the reconstructed figures for school leavers' employment, in 1979 and 1983, alongside those for all ages' employment. Table 5.36 makes use of the figures in Table 5.35 and shows school leavers' and all ages' net employment change, job gains and job losses for all the industrial categories taken together, over the period 1979–83. It can be seen from that table that school leavers accounted for nearly 14 per cent of all ages' net employment

Table 5.35

Reconstructed school leavers' and all ages' industrial distributions of employment compared, 1979 and 1983

Industrial Category	1977		1983	
	School Leavers	All Ages	School Leavers	All Ages
1. Agriculture, Forestry and Fishing	1843	48000	1478	43000
2. Mining, Quarrying; Coal & Petroleum Products	921	46000	283	47000
3. Chemicals and Allied Industries	614	32000	220	24000
4. Food, Drink and Tobacco	3317	90000	1290	73000
5. Metal Manufacture	614	34000	189	21000
6. Engineering; Venicles; Shipbuilding and Metal Goods Nes	7862	254000	3932	181000
7. Textiles; Leather, Clothing and Footwear	4545	8900	1478	58000
8. Bricks, Pottery etc; Timber, Furniture etc; Paper, Printing & Publishing, and Other Manuf Industries	2825	9600	1573	72000
9. Construction	5405	163000	3303	121000
10. Gas, Electricity and Water	614	29000	283	27000
11. Transport and Communication	1720	135000	1069	123000
12. Distributive Trades	9950	247000	5819	245000
13. Insurance, Banking, Finance and Business Services; Professional and Scientific Services; Mis Services	15662	693000	7800	700000
14. Public Administration and Defence	5466	146000	2768	148000
TOTAL	61357	2101000	31484	1882000

Source: All Ages' figures, SAS 1984

Table 5.36

Jobs gained, jobs lost and the net change in employment, school leavers and all ages, 1979-1983

	School Leavers	All Ages	% of All Ages' Jobs Gains/ Losses/Net Change Accounted for by School Leavers
Jobs Gained	C	10000	0.0
Jobs Lost	29873	229000	13.0
Net Change	-29873	-219000	13.6
Ratio of Gains to Losses	0	0.04	

Table 5.37

The decomposition of the decline in school leavers' employment according to the source of employment loss, all industries, 1979-83

Components	Number of Job Losses Accounted for by Each Component	% of Employment Decline Accounted for by Each Component
A	6396	21.4
B	775	2.6
C	22702	76.0
Total Employment Change	-29873	100.0

decline over that period. Since school leavers' share of all ages' employment in 1979 had been only 2.9 per cent, this means that school leavers' share of all ages' net employment decline was 4.7 times as large as it would have been if their employment had declined in the same proportion as all ages' employment. It can be seen from Table 5.35 that this resulted from the fact that school leavers accounted for 13 per cent of all ages' job losses and none of their job gains.

Compared to the period 1977–81, school leavers accounted for a smaller percentage of all ages' net employment decline, i.e. 13.6 per cent for 1979–83 as against 19.0 per cent for 1977–81. Also, the extent to which school leavers' share of all ages' net employment decline exceeded their initial share of all ages' employment was smaller for 1979–83 than for 1977–81, i.e. 4.7 times their initial share of employment for 1979–83 compared to 5.8 times their initial share of employment for 1977–81. Taken together, these figures suggest that school leavers began to feel the effects of demand deficiency in the goods market ahead of other labour-market groups.

Turning now to the shift-share analysis, Table 5.37 shows the effect of applying the decomposition to school leavers' total, i.e. all industries, employment decline for the period 1979–83. It can be seen from that table that the largest part of school leavers' net employment decline was attributable to the decline in industry's recruitment ratios. This component accounted for over three-quarters (76 per cent) of school leavers' net employment decline. The second largest component was that attributable to the decline in all ages' total employment. This component accounted for just over a fifth (21.4 per cent) of the net decline in school leavers' employment. The remaining part of the observed net decline in school leavers' employment (2.6 per cent) was attributable to structural change, i.e. the concentration of school leavers'

employment in particularly badly affected industries.[9]

It should be borne in mind that since no distinction is made here between all ages' full and part-time employment, the problems discussed above are likely to be present in the results of the decomposition, i.e. the component reflecting the decline in industry's recruitment ratios will be exaggerated at the expense of the components attributable to structural change and the decline in all ages' total employment.

How do the figures for the 1979-83 shift-share decomposition compare to those for 1977-81? Comparing Tables 5.15 and 5.37, it can be seen that the major differences were, firstly, that in the period 1979-83, the component attributable to the decline in industry's recruitment ratios was smaller; secondly, that in the period 1979-83, the component attributable to structural change was smaller, and, finally the component attributable to the decline in all ages' employment was larger in the period 1979-83.

To a certain extent these differences reflect the different industrial classifications utilised for the shift-share decomposition in the two periods. One would expect the structural component to be more important, and, obversely, the other two components to be less important in the period 1977-81, than in the period 1979-83, simply because more industrial categories were employed in the former period. However, another possible explanation for the differences lies in the timing of the onset of the decline in all ages' total employment and the differences between industrial categories in the timing of the onset of the decline in all ages' employment.

All ages' total employment only began to decline after 1979. Between 1977 and 1979, only the manufacturing and construction industries experienced a decline in all ages' employment. In 1977, school leavers' employment was

relatively concentrated in the manufacturing industries and construction. This would have boosted the structural component in the analysis for 1977–81. Between 1977 and 1979, school leavers' employment declined against the background of increasing all ages' total employment. This would have reduced the component attributable to the decline in all ages' total employment in the analysis for 1977–81. Between 1980 and 1983, all ages' total employment began to decline steeply. This accounts for the greater relative importance of the component attributable to the decline in all ages' total employment in the period 1979–83 as compared to 1977–81. Finally, since all ages' employment was declining in the manufacturing, service and construction industries after 1980 this would have reduced the size of the structural component in the analysis for 1979–83.

Turning now to an examination of the experiences of individual industrial categories, Table 5.38 shows the absolute number of school leavers' job losses and job gains accounted for by each of the three components in each of the fourteen industrial categories. It can be seen from that table, that the decline in recruitment ratios contributed to school leavers' job losses in every industrial category. In only two industrial categories: Mining and Quarrying etc. and the combined service industries category, could the gross effect of the increase in all ages' employment, i.e. the component reflecting the decline in all ages' total employment plus the structural component, have led to school leavers gaining jobs. As it was, the decline in these industrial category's recruitment ratios was sufficient to overwhelm the effect of the increase in all ages' employment and produce job losses for school leavers instead. In the case of the combined service industries category, industrial re-classification problems added to the apparent decline in the recruitment ratio.

Table 5.39 shows the percentage of the change in school leavers'

Table 5.38

The decomposition of the decline in school leavers' employment according to the source of job loss, 1979-1983*

Industrial Category	COMPONENTS		
	A	B	C
1. Agriculture, Forestry and Fishing	192	0	172
2. Mining, Quarrying; Coal & Petroleum Products	96	-116	658
3. Chemicals and Allied Industries	64	90	240
4. Food, drink and Tobacco	346	281	1401
5. Metal Manufacture	64	171	191
6. Engineering; Vehicles; Shipbuilding & Metal Goods Nes	819	1440	1671
7. Textiles, Leather, Clothing and Footwear	474	1109	1484
8. Bricks, Pottery etc; Timber, Furniture etc; Paper, Printing and Publishing, and Other Manuf Industries	294	412	546
9. Construction	563	829	710
10. Gas, Electricity and Water	64	-22	289
11. Transport and Communication	179	-26	497
12. Distributive Trades	1037	-957	4050
13. Insurance, Banking, Finance and Business Services; Professional and Scientific Services and Misc Services	1633	-1791	8020
14. Public Administration and Defence	570	-645	2773
TOTAL	6396	775	22702

* A negative figure indicates a potential job gain.

Table 5.39

The decomposition of the decline in school leavers' employment 1979-1983, Percentages*

Industrial Category	COMPONENTS		
	A	B	C
1. Agriculture, Forestry and Fishing	52.7	0.0	47.3
2. Mining, Quarrying; Coal & Petroleum Products	15.0	-18.2	103.1
3. Chemicals and Allied Industries	16.2	22.7	61.0
4. Food, Drink and Tobacco	17.1	13.9	69.1
5. Metal Manufacture	15.0	40.1	44.8
6. Engineering; Vehicles, Shipbuilding & Metal Goods Nes	20.9	36.6	42.5
7. Textiles; Leather, Clothing and Footwear	15.4	36.2	48.4
8. Bricks, Pottery, etc; Timber, Furniture etc; Paper, Printing and Publishing, and Other Manuf Industries	23.5	32.9	43.6
9. Construction	26.8	39.4	33.8
10. Gas, Electricity and Water	19.3	-6.5	87.2
11. Transport and Communication	27.6	-4.1	76.5
12. Distributive Trades	25.1	-23.2	98.0
13. Insurance, Banking, Finance and Business Services; Professional and Scientific Services; & Misc Services	20.8	-22.8	102.0
14. Public Administration and Defence	21.1	-23.9	102.8
ALL INDUSTRIES	21.4	2.6	76.0

* Negative figures indicate job gains

employment, in each industrial category accounted for by each of the three components. It can be seen from Tables 5.38 and 5.39 that the industrial categories whose experience came closest to that represented by the aggregate analysis, i.e. school leavers' employment decline mainly accounted for by the decline in recruitment ratios, the other two components contributing, were: Chemicals and Allied Industries; Food, Drink and Tobacco; Metal Manufacture; Engineering, Vehicles, Shipbuilding and Metal Goods NES; Textiles, Clothing and Footwear etc.; and, Bricks, Pottery etc. They represent all the manufacturing industries. So, the pattern painted by the aggregate analysis above is one characteristic of the manufacturing industries alone.

The structural component was the largest component in the case of Construction, and this added to the job losses attributable to the decline in the recruitment ratio. In the cases of Mining and Quarrying etc; the combined services category, and, Public Administration and Defence, the negative effect of the decline in the recruitment ratio overwhelmed the positive impact of the increase in all ages' employment, i.e. the decline in recruitment ratios was not restricted to those industrial categories in which all ages' employment declined. In the case of the combined services category industrial re-classification problems augmented the decline in the recruitment ratio whilst in the case of Public Administration and Defence they helped offset the decline in the recruitment ratio. In Gas, Electricity and Water; Transport and Communication, and, Distributive Trades, a less than average decline in all ages' employment combined with a decrease in the recruitment ratio to produce a decline in school leavers' employment. Finally, in Agriculture, Forestry and Fishing, school leavers' job losses were mainly due to the decline in all ages' total employment, though there was also a decline in the recruitment ratio.

In summary, the majority of school leavers' net decline in employment over

the period 1979-83 was attributable to the decline in industry's recruitment ratios. The next largest part was attributable to the decline in all ages' total employment. Compared to the period 1977-81, in the period 1979-83 structural change accounted for a smaller part of the net decline in school leavers' employment, and, the decline in all ages' total employment accounted for a larger part of school leavers' net decline in employment. Between 1979 and 1983 the decline in recruitment ratios was universal and even occurred in industries in which all ages' employment increased. Finally, the manufacturing industries were the only industries wherein school leavers' experience mirrored the pattern painted by the aggregate analysis.

5.7. Conclusion

The two aims in this Chapter were, firstly, to apply a shift-share decomposition to the change in Scottish school leavers' employment in order to discover its proximate sources. And, secondly, to compare and contrast Scottish school leavers' and all ages' industrial distributions of employment at four points in time, i.e. 1977, 1979, 1981 and 1983.

The main conclusion to come out of the shift-share analysis was that the majority of school leavers' net decline in employment between 1977 and 1981, and, between 1979 and 1983, could be attributed to the decline in industry's recruitment ratios. The decline in all ages' total employment was usually the next largest component. Structural change was usually found to have been the least important component.

The important role played by the decline in industry's recruitment ratios reflected the fact that school leavers are a peculiarly vulnerable labour market group. They are vulnerable because of their status as labour market entrants and because of any perceived deficiencies they may possess, in the eyes of

employers, relative to older workers. When firms decide to reduce recruitment, as a means of reducing the size of their work-forces, job seekers suffer. All school leavers are, by definition, job seekers; hence their employment is peculiarly vulnerable to a decline in recruitment. The reduced level of recruitment means that employers do not go as far down their labour queues as they did previously and, moreover, unemployed adults may displace school leavers at the front of employer's labour queues. The net result is that school leavers' chances of being hired decline dramatically and so does their employment.

Three important, overall, practical conclusions were derived from the shift-share analysis. Firstly, it is important to compare like with like, whenever possible, and use figures relating to all ages' full-time employment when performing the shift-share decomposition. The reasons being that, school leavers do not compete in the market for part-time employment and, that changes in all ages' total employment result from changes in full-time and part-time employment, and only the former set of changes are relevant for school leavers. The second conclusion was that it was important to present the results of the shift-share decomposition for each industrial category separately because the picture painted by the aggregate analysis usually only applied to some industrial categories, e.g. manufacturing industries, and because the relative importance of each of the three components differed markedly between industrial categories. The final overall practical conclusion was that the analysis needed to be presented for each gender separately, since there were important differences between male and female school leavers' industrial distributions of employment and the results of the analysis consequently differed between the genders, e.g. structural changes were a more important source of female school leavers' net decline in employment.

Turning to the comparison of the industrial distributions of Scottish school leavers' and all ages' employment, it was discovered that school leavers' under-representation in certain industrial categories was often associated with a history of all ages' employment decline, a high proportion of part-time workers, or, the results of minimum age restrictions. School leavers tended to be over-represented, relative to all ages, in industrial categories in which their youth gave them an advantage, firstly, because their adaptability gave them an advantage over adults for jobs in which initial training is required, and, secondly, because, in some industries, i.e. distribution, young people are reasonably close substitutes for adults and have lower rates of pay. However, industrial re-classification problems specific to school leaver data often complicated the analysis of the relationship between school leavers' and all ages' industrial distributions of employment.

The main conclusion contained in this Chapter is that school leavers' employment suffered, to an extraordinary degree, as a result of the decline in economic activity that started at the end of the 1970's. The scale of the decline in their employment was remarkable and nothing like it had been seen since the 1930's (Roberts, 1984). However the factors that made school leavers' employment vulnerable to economic downturns were not new: school leavers have always been job seekers and, school leavers' lack of experience and training etc., are not new. The novel factor in precipitating the severe decline in school leavers' employment was the depth of the downturn in the UK. economy.

Footnotes

1. The shift-share decomposition could conceivably be performed using data relating to all ages' and school leavers' occupational distributions of employment as well. Unfortunately, the lack of adequate data relating to all ages' occupational distribution of employment in Scotland meant that the application of the shift-share technique had to be restricted to all ages' and school leavers' industrial distributions of employment.

2. In fact, it was because the resulting analysis would be rather disjoined that it was decided to incorporate the material relating to the comparison between the industrial distributions of Scottish school leavers' and all ages' employment into this Chapter. The reason being that the shift-share analysis had to be disjoined anyhow, whereas the examination of Scottish school leavers' industrial distribution of employment did not need to be disjoined.

3. The reason why Holden *et al.* (1986) make their first criticism: that the technique implicitly assumes a particular explanation of regional employment change in which there is no feedback from the change in an industry's employment nationally to the change in its employment in a region, has to do with its specific application to regional analysis. They argue that in the past those industries which were experiencing an employment decline nationally tended to attract regional aid and that this affected their employment performance differentially between regions, according to each region's relative reliance on assisted industries.

4. There are three ways in which the SEDA data differ from the all ages data. Firstly, the SEDA data contain a number of supernumerary categories which have to be dealt with. (See Appendix 2.1.) Secondly, whilst the SEDA data only refer to the Tayside, Strathclyde, Lothian and Fife regions, the all ages data relate to the whole of Scotland. Thirdly, the SEDA data refer to the period March-May of the year concerned, whereas the all ages data refer to June in 1977 and September in 1981.

5. It is interesting to note that Ashton and Maguire (1982), in their study of young peoples' employment in Leicester, Sunderland and St Albans in the late 1970's, and Ashton and Maguire (1986), in their study of young peoples' employment in Leicester, Sunderland, Stafford and St Albans in 1982-83, found a similar pattern of over and under-representation of young peoples' employment in certain industries.

6. The difference of 59 between school leavers' net decline in employment shown in Tables 5.14 and 5.15 results from rounding errors and represents an error of 0.4% on the total shown in Table 5.14. Differences in the corresponding tables later in the Chapter owe their origin to the same source.

7. Main and Raffe (1983a) applied the same shift-share decomposition as employed here to the absolute change in Scottish school leavers' employment over the period 1977 to 1981. They found that over two-thirds (68.3 per cent) of school leavers' employment decline was attributable to the decline in recruitment ratios. Only 5.8 per cent was attributable to structural change. The remaining part of school leavers' net employment decline (25.9 per cent) was found to be attributable to the decline in all

ages' total employment.

The differences between the relative importance of the three components of the decline in school leavers' employment between Main and Raffe's (1983a) results and those reported here are mainly due to the difference in the figures used for all ages' total employment in Scotland. Main and Raffe's (1983a) figure for all ages' total employment in 1977 was only 1,000 less than that used here, but their figure for all ages' total employment in 1981 was 66,000 less than the figure used here. The large difference between the figures for all ages' total employment in 1981 was due to the fact that Main and Raffe (1983a) had to use an estimate, whereas the figure used here was derived from the 1981 Census of Employment.

When Main and Raffe's (1983a) analysis is re-worked using the same figures for all ages' total employment as used here (and the same industrial classification schema as used by Main and Raffe (1983a)), and changing nothing else, i.e. the industrial distribution of all ages' employment and school leavers' absolute employment in each of Main and Raffe's (1983a) seven industrial categories, the results obtained are very similar to those obtained here. The re-calculated figures indicate that 13.9 per cent of the decline in school leavers' employment can be attributed to the decline in all ages' total employment, 6 per cent can be attributed to structural change, and, the remaining 80 per cent can be attributed to the decline in recruitment ratios. The small differences between the re-calculated Main and Raffe (1983a) results and the results obtained here are due to the remaining differences between the data used by Main and Raffe (1983a) and that used here.

8. Between 1979 and 1983, both all ages and school leavers experienced a relative shift away from the manufacturing industries. For all ages it was a 5.5 percentage point shift, with the manufacturing industries accounting for 28.3% of their total employment in 1979 and 22.8% in 1983. For school leavers it was a 4.6 percentage point shift, with the manufacturing industries accounting for 32.2% of their total employment in 1979 and 27.6% in 1983.

   The service industries increased their share of both all ages' and school leavers' total employment between 1979 and 1983, i.e. a 6.5 percentage point shift from 58.1% to 64.6%, in the case of all ages, and a 2.1 percentage point shift from 53.4% to 55.5% in the case of school leavers.

   The construction industry increased its share of school leavers' employment, between 1979 and 1983, by 1.7 percentage points; from 8.8% to 10.5%. It decreased its share of all ages' employment by 1.4 percentage points; from 7.8% to 6.4%

9. Raffe (1984c) performed the same shift-share decomposition as performed here, on the SEDA data, over the same period. The differences between that exercise and this one were that Raffe (1984c) used a different industrial classification system and an earlier version of the 1983 SEDA data set. Raffe (1984c) found that 73.3 per cent of the net decline in school leavers' employment was attributable to the decline in industry's recruitment ratios, 23.8 per cent was attributable to the decline in all ages' total employment and the remaining 3 per cent was attributable to structural change. Despite the differences in industrial classification

schemas and data vintages, Raffe's results and the results presented here are very similar. This suggests that the shift-share results are reasonably robust.

CHAPTER 6

HAS THE BOTTOM FALLEN OUT OF THE YOUTH LABOUR MARKET?

6.1. Introduction

6.1.1. Preface

It has been widely found that educationally qualified young people have a greater chance of getting a job, and hence less chance of suffering unemployment, than unqualified and less qualified young people and that these differences increase during a time of recession. (NYEC, 1974; MSC, 1978; Gray *et al*, 1983; Raffe, 1983a,b; Seatter, 1983; McLeod *et al*, 1983; Main and Raffe, 1983c; Payne, 1985; Payne and Payne, 1985; Jones, 1985; Breen, 1985). Starting from these findings, the aim in this Chapter is to use the 1977 and 1983 SEDA data to examine the link between school leavers' educational attainment and the change in their non-employment between 1977 and 1983, and, in particular, to examine the claim that: "The bottom, but not the top, has fallen out of youth labour markets..." (Roberts *et al*, 1986, p23).

The central argument in this Chapter is that when considering a labour market one must consider supply as well as demand, since the number of young people out of work is equal to the difference between supply and demand. As will be discussed in sub-section 6.1.3, the existing work on the relationship between young people's educational attainment and non-employment; where non-employment is defined as unemployment and participation on state schemes for the young unemployed, have mainly stressed demand side factors, almost to the exclusion of supply side factors. Young peoples' labour supply must be considered because there are good reasons to believe (see Section 6.4) that young people will adapt their supply behaviour in response to changes in their employment prospects and that these changes

might, to some extent, reduce the number of non-employed unqualified and less qualified young people below what it might otherwise be.

If the bottom dropped out of the youth labour market this would cause concern for several reasons. Firstly, one would be concerned about the welfare of those young people who have little to show for their time in the educational system and who go on to suffer non-employment after school. Secondly, State schemes for the young unemployed need to be designed to suit their clients. If their client group is likely to be largely drawn from the unqualified and least qualified school leavers, this might limit the scope for, and type of, training that could be provided and might also lead to the stigmatisation of such schemes. Finally, if young people reacted to the bottom dropping out of their labour market by attempting to obtain more educational qualifications, stay-on longer at school, or, continue in full-time tertiary education, this would place greater demands on the educational system's resources.

6.1.2. The Scale of the Problem in Scotland

To start with it is necessary to note that it was decided to consider males and females separately in this Chapter, but not together, since a central concern here is with school leavers' occupational distribution of employment and it has been shown in Chapter Three that there existed significant differences between male and female school leavers' occupational distributions of employment.

In order to gain an initial grasp of the scale of the problem in Scotland in 1977 and 1983, Table 6.1 and Figures 6.1 and 6.2 show female and male school leavers' non-employment rates at each of fourteen levels of Scottish Certificate of Education (SCE) attainment in 1977 and 1983. Table 6.1 also shows the unweighted N's and the coefficients of variation between non-employment

Table 6.1

Female and Male School Leaver's Nonemployment Rates by Qualification Level

1977 and 1983

SCE Attainment	Females			Males		
	1977	1983	Change 1977-83	1977	1983	Change 1977-83
1. Unqualified	27.8	70.1	+42.3	33.1	67.8	+34.7
2. O Grade Fails	15.1	61.2	+46.1	13.8	54.3	+40.5
3. One O Grade	12.1	56.1	+43.9	14.3	47.0	+32.7
4. Two O Grades	6.3	50.4	+44.1	6.7	33.0	+26.3
5. Three O Grades	7.4	41.4	+34.1	5.6	29.6	+23.9
6. Four O Grades	4.4	29.2	+24.8	8.1	29.1	+21.0
7. Five O Grades	3.7	21.2	+17.5	5.1	20.7	+15.5
8. Six Plus O Grades	10.7	47.1	+36.4	6.0	27.3	+21.3
9. One Higher	9.4	27.6	+18.2	11.5	33.2	+21.7
10. Two Highers	9.9	24.0	+14.1	7.3	32.2	+24.9
11. Three Highers	11.4	14.7	+ 3.2	3.1	30.1	+26.9
12. Four Highers	7.0	25.7	+18.7	13.0	20.9	+ 7.9
13. Five Highers	16.9	20.4	+ 3.5	30.0	36.4	+ 6.4
14. Six Plus Highers	0.0	66.1	+66.1	13.1	32.2	+19.0
Average, All Levels of SCE Attainment	10.0	39.7	+29.7	12.2	35.3	+23.1
Coefficient of Variation	0.69	0.47		0.74	0.37	
Unweighted N's	2383	1607		2628	1854	

Figure 6.1 Female School Leavers' Nonemployment Rates by SCE Attainment in 1977 and 1983

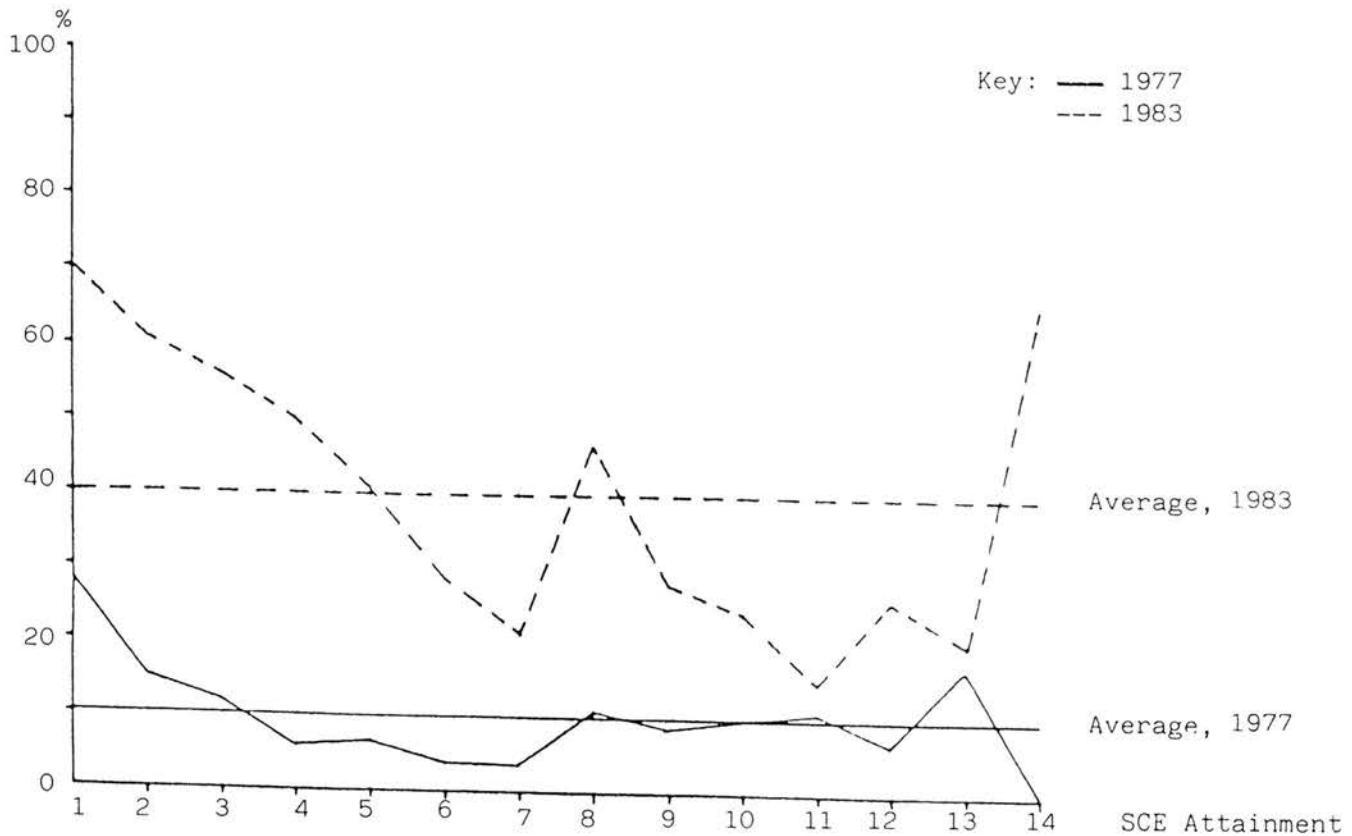
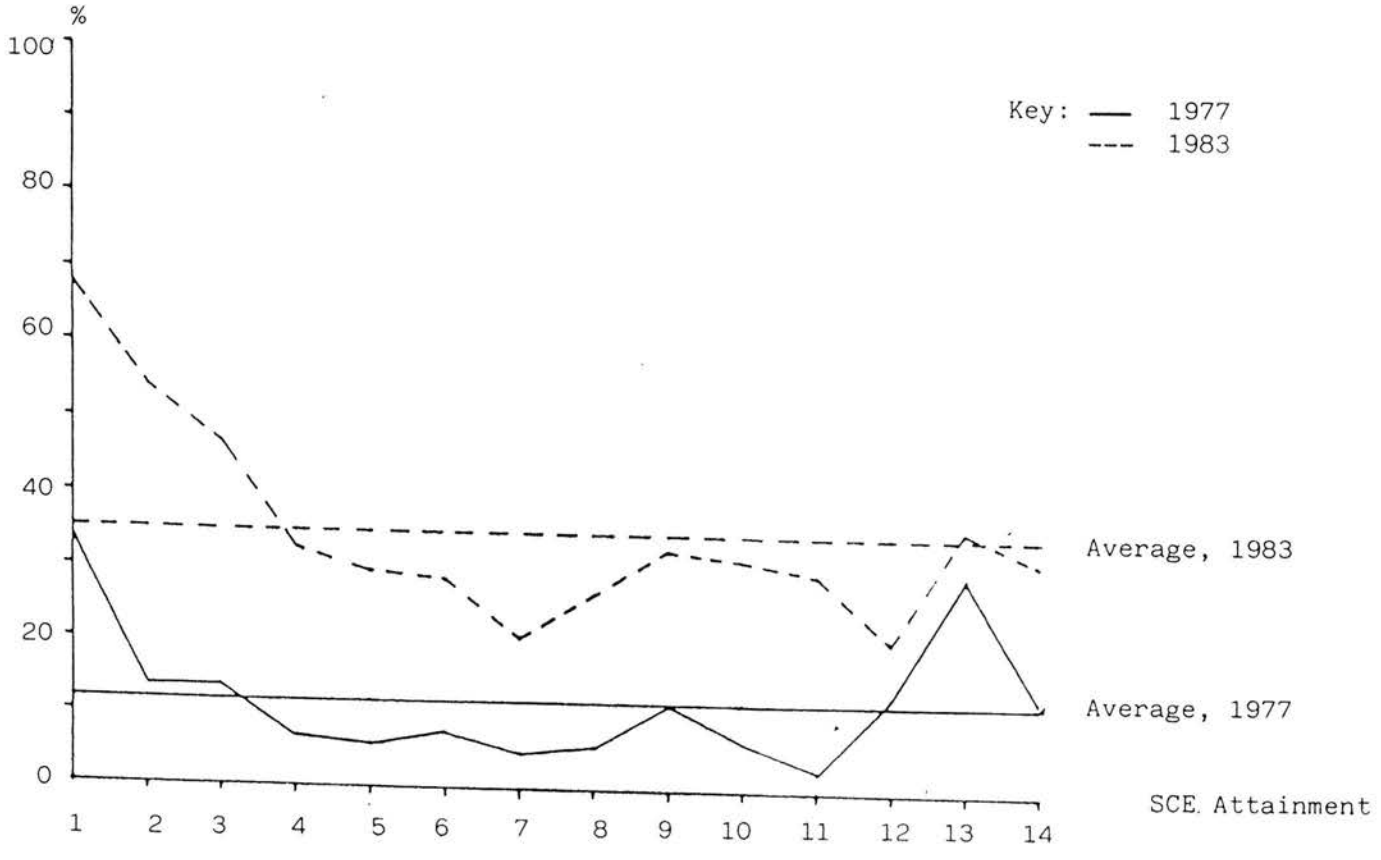


Figure 6.2 Male School Leavers' Nonemployment Rates by SCE Attainment in 1977 and 1983



rates and SCE attainment. Like all the tables and figures in this Chapter, Table 6.1 and Figures 6.1 and 6.2 are based on weighted data restricted to those school leavers in the labour market who came from state sector schools in four regions of Scotland, namely, Fife, Lothian, Strathclyde and Tayside. The data are additionally restricted to those who gave valid responses concerning their educational qualifications and post-school destinations. The measure of school leaver's educational qualifications utilised here is a fourteen point scale of SCE attainment, ranging from one, for the unqualified, to fourteen, for those possessing six plus Highers. This scale is described in Appendix 6.1.

Returning to the analysis, it can be seen from Table 6.1 and Figures 6.1 and 6.2 that non-employment rates noticeably varied with educational attainment, in both 1977 and 1983, being particularly high for the unqualified and those possessing O grade fails. It can also be seen from Table 6.1 that, between 1977 and 1983, male school leavers' average, i.e. all levels of SCE attainment, non-employment rate nearly tripled and female school leavers' average non-employment rate nearly quadrupled. For both female and male school leavers, the largest percentage point increases in the non-employment rate were usually experienced by the least qualified. The increase in school leavers' non-employment almost certainly reflected an increase in their involuntary non-employment.[1] Finally, from Table 6.1 it can be seen that the coefficients of variation decreased in value for both genders between 1977 and 1983. This reflected the spread of above average non-employment rates up the SCE attainment scale between 1977 and 1983.

So, unqualified and less qualified Scottish school leavers did experience higher rates of non-employment than their better qualified peers in both 1977 and 1983, and it was the unqualified and less qualified who tended to experience the largest percentage point increases in their non-employment

rates between 1977 and 1983. It can be seen from Figures 6.1 and 6.2 that the relationship between SCE attainment and non-employment rates grew stronger at the lower levels of SCE attainment between 1977 and 1983. The above findings provide the starting point for the following analysis of the relationship between the increase in Scottish school leavers' non-employment and their educational attainment.

6.1.3. Two Explanations of The Relationship Between The Decline in Young Peoples' Employment and Their Educational Attainment

Introduction

The two main hypotheses which have been proposed to explain why unqualified and less qualified young peoples' non-employment has increased to a greater extent than that of their better qualified peers in recent years are: the "structural" hypothesis (NYEC, 1974; Ashton and Maguire, 1982; Roberts, 1986; Roberts *et al*, 1986) and the "labour queue" hypothesis (Main and Raffe, 1983a; Raffe, 1984b; Main 1985b). In both hypotheses, it is changes in the educational attainment composition of employers' demand for young peoples' labour that are held to have caused unqualified and less qualified young peoples' non-employment to have increased to the greatest extent. (From here on, the term "composition" is used to mean the proportions of a total, relating to school leavers, accounted for by school leavers at each level of educational attainment.) Where the hypotheses differ is in their emphasis as to the major cause of the changes in the composition of employers' demand for young peoples' labour, and, consequently, in their expectations of the extent to which unqualified and less qualified young peoples' particularly high rates of non-employment could be reduced by an increase in the general level of economic activity.

The Structural Hypothesis

According to the structural hypothesis, changes in the pattern of demand for goods and services and changes in production techniques, have combined to cause, and will continue to cause, changes in the occupational structure of employment which have adversely affected unqualified and less qualified young peoples' employment. These changes in the occupational structure of employment are not contended to be necessarily linked to the general level of economic activity; although they are believed to have accelerated in the recession after 1979. The changes include: the shift from manufacturing to service industry employment, upskilling in the work-process, the rise of industries based upon new technology, e.g. computing and biotechnology, the mechanisation of previously unskilled manual work, e.g. robots replacing workers in car assembly, etc. These changes are held to have had the effect of reducing the number of semi and unskilled job openings for unqualified and less qualified young people. At the same time, the number of trainee-managerial, trainee-professional, technical and skilled manual jobs, in which better qualified young people are often employed, is claimed to have increased. Consequently, Roberts *et al*, (1986) argue that a growing structural mismatch, between the composition of the demand for, and supply of, young peoples' labour has emerged. Since this structural mismatch is believed to result from secular trends, and these trends are not held to be directly related to the general level of economic activity, an increase in the general level of economic activity cannot, it is claimed, be expected to remove this structural non-employment (Roberts *et al*, 1986).

The major policy implication of the structural hypothesis is that, even if the general level of economic activity were to increase to such an extent as to significantly increase all ages' employment, measures would still be required to

improve the quality, e.g. educational attainment, of young peoples' labour supply. Specific measures would include: changing the education system so as to reduce the proportion of young people leaving school with few or no qualifications, training programmes designed to increase the attractiveness of young people to potential employers, and, a reduction of unqualified and less qualified young peoples' labour supply via increased participation in continued full-time tertiary education.

The Labour Queue Hypothesis

The labour queue hypothesis is based upon Thurow's (1976) "labour queue" model (Main and Raffe, 1983a; Raffe, 1984b; Main, 1985b). Since this model was discussed in Chapter One, the discussion here will be brief. In the model, employers are assumed to offer "training slots", with a fixed wage attached, to applicants. Applicants then compete for such vacancies on the basis of their expected training costs. Employers are assumed to use applicant's observable characteristics, such as: educational qualifications, gender, age etc.; as predictors of training costs. Employers then rank applicants in their labour queues according to their expected training costs, with those with the lowest expected training costs nearest the front. Employers then proceed down their labour queues hiring workers until they meet their labour requirements. These labour requirements are, in turn, determined by firm's sales.

Since employers will differ among themselves as to which observable characteristics they believe to be good predictors of training costs and in their beliefs as to each observable characteristic's relative importance, and, finally, because jobs will differ in their training requirements, all applicants will have some chance of getting a job. Furthermore, the observable characteristics which employers use in deciding which applicants to hire will, most probably, be positively correlated with applicant's reservation wage-rates, so that

applicants most favoured by employers will not apply for low paid jobs. Hence, employers offering low wage-rates will have to form their labour queues from less attractive applicants. For all these reasons, even less attractive applicants stand some chance of securing a job, if not a well paid job.

When firms experience a decline in their sales they will react by reducing the scale of their hiring and will not proceed as far down their labour queues as they did previously. This will especially reduce the employment chances of less attractive applicants, causing a change in the composition of employers' demand for labour in favour of more attractive applicants, e.g. the better qualified.

According to proponents of the labour queue hypothesis, the recent changes in the composition of the demand for young peoples' labour were the result of a deficiency in the aggregate demand for goods and services. However, it is contended that these changes are not permanent and could be reversed by a government initiated increase in aggregate demand, and hence economic activity; this is their main policy conclusion.

Finally, Raffe (1984b) has argued that much recent occupational upskilling is, in fact, the result of the uneven impact of demand deficiency across industries and occupations, which has especially hit the manufacturing industries and unskilled and semi-skilled workers. Since the manufacturing industries previously employed a large number of manual workers, the decline in employment in such industries will have produced a shift towards non-manual occupations. Also, the unskilled and semi-skilled can be expected to have suffered particularly large job losses because they are cheaper to discharge than more skilled workers, because they have had little invested in their training by employers and, hence, employers experience smaller losses of

investment expenditures when they discharge such workers.

Conclusion

In conclusion, both the proponents of the structural and labour queue hypotheses contend that the main reason why unqualified and less qualified young people have experienced a greater increase in their non-employment than that experienced by their better qualified peers is that there has been a change in the composition of employers' demand for their labour. The proponents of the structural hypothesis maintain that the change is irreversible. The proponents of the labour queue hypothesis maintain that the change can be reversed by removing the deficiency in aggregate demand. The main difference between the two hypotheses lies in the relative importance they attach to changes in the occupational distribution of young peoples' employment in changing the composition of employers' demand for young people's labour. The proponents of the structural hypothesis place great stress on occupational change, whereas the proponents of the labour queue hypothesis emphasise the raising of hiring standards within occupations.

6.1.4. The Rest of The Chapter

The aim in the rest of the Chapter is to examine the changes in school leavers' employment and labour supply in order to see how they interacted to produce the observed increase in school leavers' non-employment at each level of educational attainment. This examination makes use of variants of the shift-share technique to examine the roles played by changes in the levels of school leavers' labour supply and employment, on the one hand, and changes in the composition of their labour supply and employment, on the other hand, in bringing about the observed rise in their non-employment at each level of educational attainment between 1977 and 1983.

To that end, Section 6.2 contains a graphical account of the effect of changes in the levels and composition of school leavers' employment and labour supply upon their non-employment, as well as a discussion of the results of a shift-share decomposition of the rise in school leavers' non-employment, at each level of educational attainment, into level and composition induced components. Section 6.3 contains a discussion of the results of a shift-share analysis of the changes in the composition of school leavers' employment. Section 6.4 contains a discussion of the results of a shift-share decomposition of the changes in school leavers' labour supply. Section 6.5 contains a discussion of the results of a counter-factual experiment designed to gauge the effect that occupational change would have had upon school leavers' non-employment, between 1977 and 1983, in the absence of any decline in the level of their employment or change in the composition of their labour supply. Section 6.6 contains concluding remarks.

6.2. A Shift-Share Decomposition of The Rise in School Leavers' Non-employment, 1977-83

6.2.1. Introduction

The aim in this section is to discuss how changes in the levels and composition of school leavers' employment and labour supply combined to bring about the observed rise in their non-employment, at each level of educational attainment.[2] The discussion starts with a graphical account of a hypothetical example of how changes in the levels, and composition of, school leavers' employment and labour supply might have combined to bring about differential changes in their non-employment at two levels of educational attainment and then proceeds to the results of a shift-share decomposition of the changes in school leavers' non-employment, at each level of educational attainment, into employment and labour supply level and composition induced

components.

6.2.2. A Hypothetical Example

To start, assume that school leavers come in two varieties: the well qualified and the poorly qualified and consider the following hypothetical example. Figure 6.3a shows the situation in the market for well qualified school leavers' labour and Figure 6.3b shows the situation in the market for poorly qualified school leavers' labour. It is assumed that school leavers' wages are very slow to adjust to equate supply and demand and, for simplicity's sake, Figures 6.3a and 6.3b are drawn up with constant real wages.

Starting with well qualified school leavers, the demand curve for their labour in 1977 is shown by the solid line labelled D1977 and their supply of labour curve is shown by the solid line labelled S1977. In 1977, therefore, there were e-c non-employed well qualified school leavers. The dashed line D*1983 shows the demand curve for well qualified school leavers' labour which would have pertained if the demand for their labour had declined in the same proportion as the demand for all, i.e. well and poorly qualified combined, school leavers' labour. The solid line D1983 shows the demand curve that is assumed to have actually pertained in 1983. It lies to the right of the dashed demand curve, D*1983, because, between 1977 and 1983, employers are assumed to have raised their hiring standards.

Turning now to the supply of well qualified school leavers' labour, the dashed line in Figure 6.3a labelled S*1983 shows the supply curve that would have pertained if the supply of their labour to the market had declined in the same proportion as the supply of all, i.e. well and poorly qualified combined, school leavers' labour. The solid line labelled S1983 shows the supply curve that is assumed to have actually pertained in 1983. It lies to the right of the

Figure 6.3a: Well Qualified School Leavers

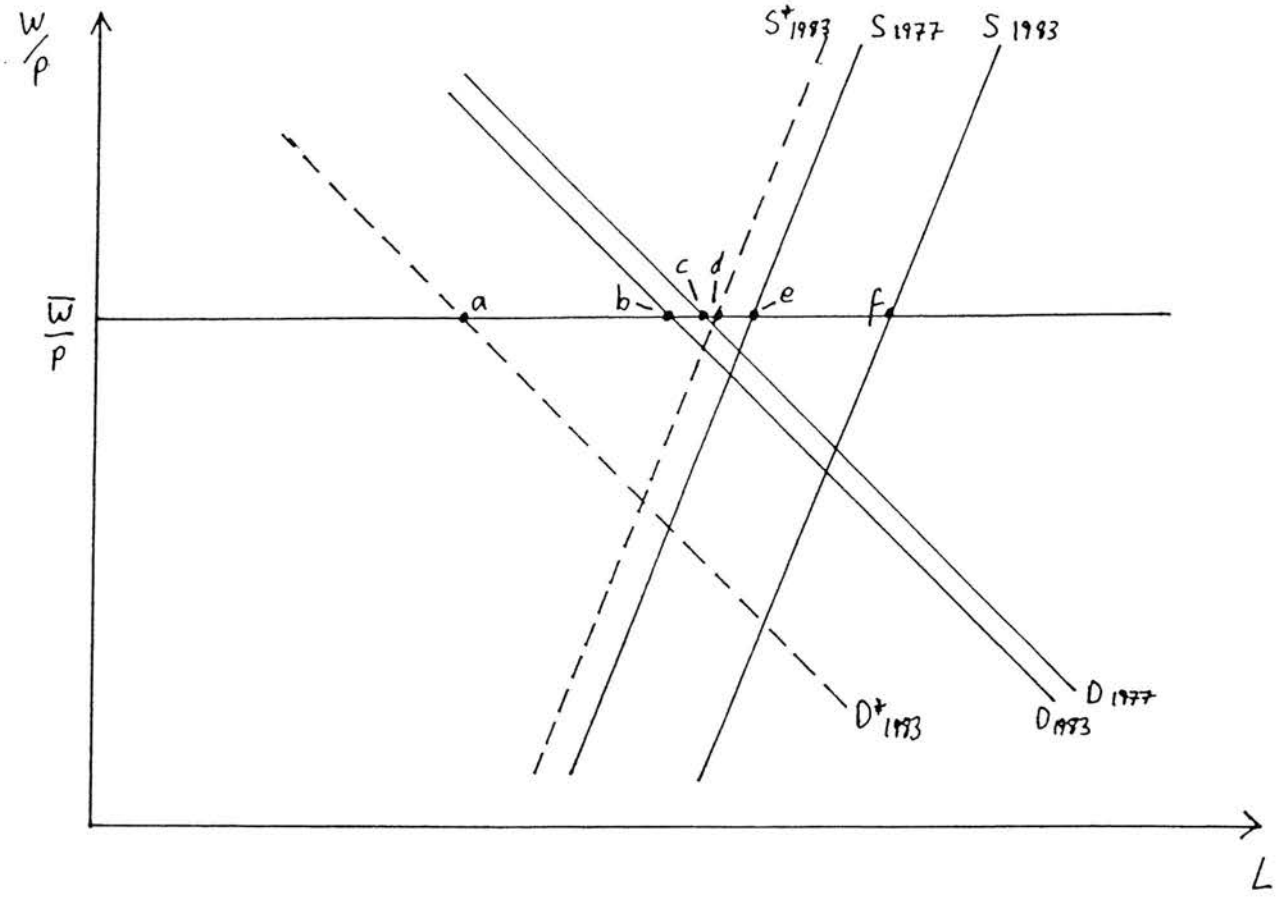
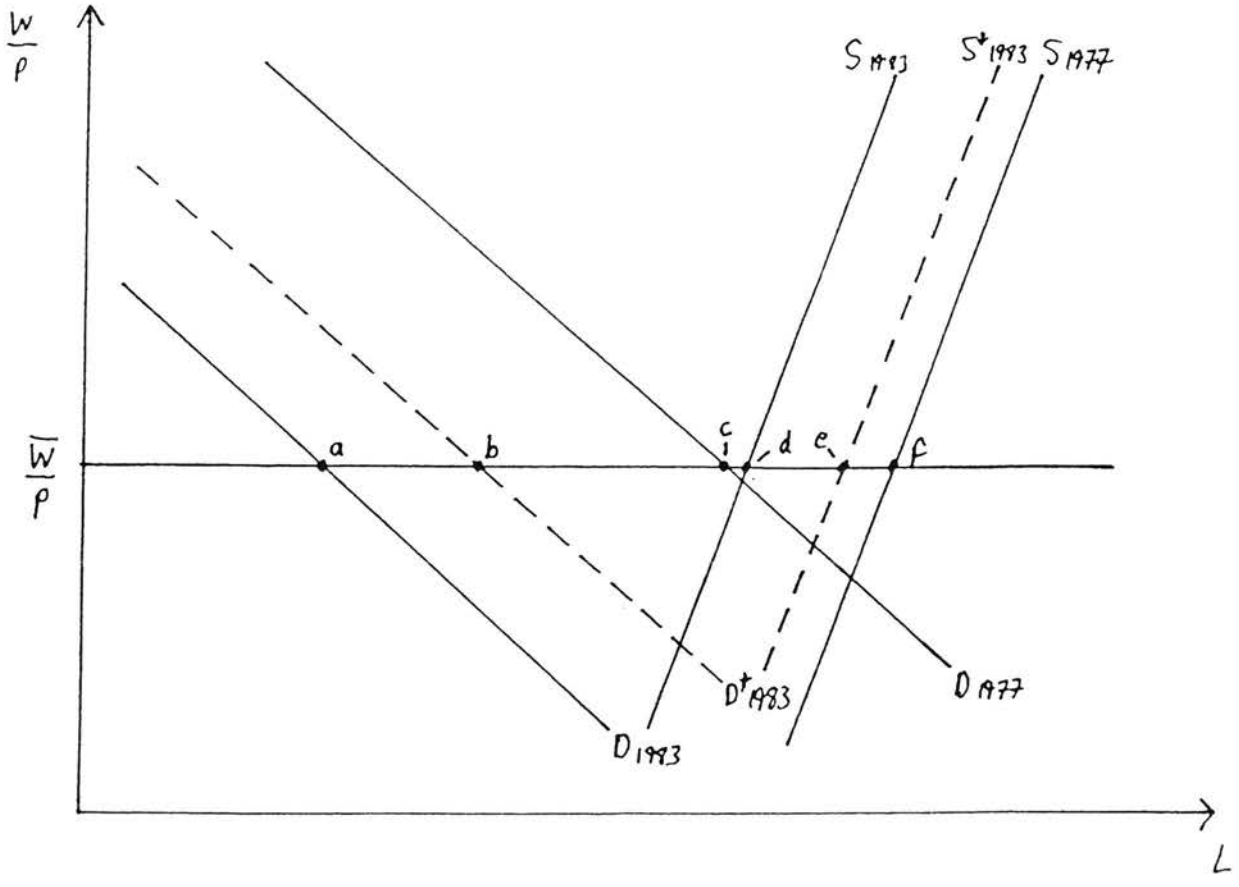


Figure 6.3b: Poorly Qualified School Leavers



dashed supply curve, S*1983 because, between 1977 and 1983, it is assumed that the well qualified came to represent a larger proportion of all those school leavers in the labour market.

So, as shown in Figure 6.3a, the decline in the overall level of demand for school leavers' labour, i.e. the decline in the level of their total employment, would have served to increase well qualified school leavers' non-employment. However, the potential increase in their non-employment from this source was largely offset by a favourable change in the composition of demand. On the supply side, the decline in the overall level of school leavers' labour supply would have served to decrease well qualified school leavers' non-employment. However, this potential reduction in their non-employment was negated and reversed by a change in the composition of school leavers' labour supply. Finally, there were f-b non-employed well qualified school leavers in 1983.

Turning now to the experience of poorly qualified school leavers, the demand curve for their labour in 1977 is shown, in Figure 6.3b, as the solid line labelled D1977 and their labour supply curve is shown by the solid line S1977. In 1977, therefore, there were f-c non-employed poorly qualified school leavers. The dashed line D*1983 shows the demand curve that would have pertained in 1983 if the demand for their labour had declined in the same proportion as the demand for all school leavers' labour. The solid line D1983 shows the demand curve that is assumed to have actually pertained in 1983. It lies to the left of the dashed demand curve because, between 1977 and 1983, employers are assumed to have raised their hiring standards.

Turning now to poorly qualified school leavers' labour supply, the dashed line in Figure 6.3b, labelled S*1983, shows the supply curve that would have pertained in 1983 if their labour supply had declined in the same proportion as

school leavers' total labour supply. The solid line, labelled S1983, shows the supply curve that is assumed to have actually pertained in 1983. It lies to the left of the dashed supply curve because it is assumed that, between 1977 and 1983, the poorly qualified came to represent a smaller proportion of all those school leavers in the labour market.

So, as shown in Figure 6.3b, the decline in the overall level of demand for school leavers' labour, i.e. the decline in the level of their total employment, would have served to increase poorly qualified school leavers' non-employment. The potential increase in their non-employment from this source was augmented by the change in the composition of demand. On the supply side, the decline in the overall level of school leavers' labour supply would have served to decrease poorly qualified school leavers' non-employment. The potential decrease in their non-employment from this source was augmented by the change in the composition of school leavers' labour supply. Finally, there were d-a non-employed poorly qualified school leavers in 1983.

6.2.3. The Shift-Share Decomposition of The Rise in School Leavers' Non-employment at Each Level of SCE Attainment, 1977-83

Table 6.2 shows the estimated number of non-employed female and male school leavers, at each level of SCE attainment, in Scotland in 1977 and 1983. These figures were estimated by grossing up the SEDA estimates to population levels.[3] The figures in Table 6.2 provide the basis for the following shift-share decomposition.

Table 6.3 shows the results of applying the shift-share decomposition to the estimated figures for female school leavers' non-employment and Table 6.4 shows the same for males. The level effects referred to in these tables were

Table 6.2

The Estimated Number of Nonemployed School Leavers at Each Level of SCE Attainment in 1977 and 1983

SCE Attainment	Males 1977	Males 1983	Females 1977	Females 1983
1. Unqualified	3898	6725	5605	9065
2. O Grade Fails	581	2018	525	1897
3. One O Grade	366	1680	621	1590
4. Two O Grades	155	750	195	930
5. Three O Grades	136	728	124	479
6. Four O Grades	74	409	131	462
7. Five O Grades	36	150	68	217
8. Six Plus O Grades	87	418	97	409
9. One Higher	169	578	207	586
10. Two Highers	138	387	110	361
11. Three Highers	95	226	25	257
12. Four Highers	33	237	74	134
13. Five Highers	26	83	91	156
14. Six Plus Highers	0	70	7	17
All School Leavers	5794	14459	7880	16559

Table 6.3

The Absolute Change in Female School Leavers' Nonemployment Decomposed into The Level Effect and Composition Effect, 1977--83

SCE Attainment	The Change in Nonemployment	The Change in Supply	Components of the Change in Potential Supply		The Change in Employment	Components of the Change in Employment	
			Level Effect	Composition Effect		Level Effect	Composition Effect
1. Unqualified	+2827	-4443	-1911	-2533	+7270	+4858	+2413
2. O Grade Fails	+1437	-553	-524	-28	+1990	+1567	+423
3. One O Grade	+1314	-22	-411	+390	+1336	+1271	+65
4. Two O Grades	+595	-987	-337	-651	+1582	+1112	+470
5. Three O Grades	+591	-99	-252	+154	+690	+823	-133
6. Four O Grades	+335	-265	-227	-39	+601	+763	-163
7. Five O Grades	+114	-267	-133	-134	+381	+450	-69
8. Six Plus O Grades	+331	+73	-111	+184	+258	+348	-91
9. One Higher	+409	+300	-244	+544	+109	+778	-669
10. Two Highers	+249	+219	-190	+408	+30	+602	-572
11. Three Highers	+131	+710	-113	+823	-579	+353	-932
12. Four Highers	+204	+456	-63	+520	-252	+207	-460
13. Five Highers	+57	+254	-21	+275	-196	+61	-258
14. Six Plus Highers	+71	+84	-3	+87	-13	+11	-24
All School Leavers	+8665	-4540	-4540	0	+13205	+13205	0

Table 6.4

The Absolute Change in Male School Leavers' Nonemployment Decomposed into Level Effects and Composition Effects

SCE Attainment	The Change in Nonemployment	The Change in Supply	Components of the Change in Potential Supply		The Change in Employment	Components of the Change in Employment	
			Level Effect	Composition Effect		Level Effect	Composition Effect
1. Unqualified	+3460	-3581	-2616	-965	+7040	+5627	+1773
2. O Grade Fails	+1372	-311	-589	+275	+1683	+1521	+162
3. One O Grade	+969	-974	-672	-301	+1943	+1734	+209
4. Two O Grades	+735	-85	-447	+362	+820	+1255	-435
5. Three O Grades	+355	-583	-340	-244	+939	+965	-27
6. Four O Grades	+331	-33	-250	+216	+364	+690	-327
7. Five O Grades	+149	-278	-205	-74	+427	+585	-157
8. Six Plus O Grades	+312	-116	-249	+133	+429	+703	-275
9. One Higher	+378	-34	-277	+244	+412	+738	-325
10. Two Highers	+251	-389	-233	-157	+640	+651	-10
11. Three Highers	+232	+45	-125	+170	+187	+365	-177
12. Four Highers	+60	+75	-87	+162	-15	+229	-243
13. Five Highers	+65	+125	-47	+172	-60	+98	-158
14. Six Plus Highers	+10	-3	-9	+6	+12	+23	-10
All School Leavers	+8679	-6144	-6144	-1	+14823	+14823	0

calculated by allowing for the changes in the levels of school leavers' employment and labour supply whilst keeping their compositions at their 1977 configurations. They, therefore, show how school leavers' non-employment would have changed at each level of SCE attainment, if there had been no compositional changes. The composition effects are calculated as the actual changes minus the level effects and show the change in school leavers' non-employment, at each level of SCE attainment, attributable to the changes in the composition of school leavers' employment and labour supply.

It can be seen from Tables 6.3 and 6.4 that the employment level effect added to both female and male school leavers' non-employment, whilst the supply level effect acted to reduce their non-employment, at each level of SCE attainment. It can also be seen from Tables 6.3 and 6.4 that female and male school leavers' non-employment increased at all levels of SCE attainment, and that the unqualified accounted for a large part of the increase in school leavers' total non-employment. It can also be seen that the decline in employment, i.e. level and composition effects combined, was, with some exceptions, *the* reason why school leavers' non-employment increased. Among female school leavers the exceptions were those school leavers with Highers; for whom the increase in supply contributed the largest part. In fact, the increase in supply was *the* cause of the increase in non-employment among those females with three Highers or more, since their employment actually increased. The exceptions among male school leavers were those with four or five Highers, for whom the increase in their labour supply was *the* cause of the rise in their non-employment, since it overwhelmed the increase in their employment.

Turning to a consideration of the composition effects, it can be seen from Table 6.3 that, in the case of female school leavers, the supply composition effect was negative at all the lower levels of SCE attainment, apart from those

with one or three O Grades, and positive for those with six or more O Grades or Highers. The employment composition effect, on the other hand, was positive for those with two O Grades or less and negative for the rest. From Table 6.4 it can be seen that in the case of male school leavers, the supply composition effect was negative for the unqualified, those with one O Grade, those with three O Grades, those with five O Grades and those with two Highers; and positive at all other levels of SCE attainment. The employment composition effect was positive for those with one O Grade or less, and negative at all other levels of SCE attainment.

Tables 6.5 and 6.6 show female and male school leavers' net (employment plus labour supply) level and composition effects, respectively. It can be seen from the tables that the net level effect contributed to female and male school leavers' non-employment at each level of SCE attainment, and that the net composition effect tended to operate to the disadvantage of the less qualified; with the exceptions of unqualified females and female school leavers with four or more Highers, and to the advantage of other school leavers. The relationship between the net composition effect and school leavers' SCE attainment was not unequivocally bad for the unqualified and less qualified, because although the employment composition effect unequivocally added to the increase in non-employment experienced by unqualified and less qualified school leavers and reduced the increase in non-employment experienced by the better qualified, changes in the composition of school leavers' labour supply often offset, and occasionally overwhelmed, the employment composition effect.

Finally, Table 6.7 shows the index of dis-similarity figures for the changes in female and male school leavers' labour supply and employment between 1977 and 1983, respectively. It can be seen from the figures that, for both genders, the changes in the composition of their employment were greater

Table 6.5

Female School Leavers' Net Level and Net Composition Effects

SCE Attainment	Net Level Effect	Net Composition Effect	Change in Nonemployment
1. Unqualified	+2947	-120	+2827
2. O Grade Fails	+1043	+395	+1437
3. One O Grade	+860	+455	+1314
4. Two O Grades	+775	-181	+595
5. Three O Grades	+571	+21	+591
6. Four O Grades	+536	-202	+335
7. Five O Grades	+318	-203	+114
8. Six Plus O Grades	+237	+93	+331
9. One Higher	+534	-125	+409
10. Two Highers	+412	-164	+249
11. Three Highers	+240	-109	+131
12. Four Highers	+144	+60	+204
13. Five Highers	+40	+17	+57
14. Six Plus Highers	+8	+63	+71
All School Leavers	+8665	0	+8665

Table 6.6

Male School Leavers' Net Level and Net Composition Effects

Qualification Level	Net Level Effect	Net Composition Effect	Change in Nonemployment
1. Unqualified	+2652	+808	+3460
2. O Grade Fails	+934	+437	+1372
3. One O Grade	+1061	-92	+969
4. Two O Grades	+808	-73	+735
5. Three O Grades	+625	-271	+355
6. Four O Grades	+440	-111	+331
7. Five O Grades	+380	-231	+149
8. Six Plus O Grades	+455	-142	+312
9. One Higher	+461	-81	+378
10. Two Highers	+417	-167	+251
11. Three Highers	+239	-7	+232
12. Four Highers	+141	-81	+60
13. Five Highers	+52	+14	+65
14. Six Plus Highers	+14	-4	+10
All Qualification Levels	+8679	-1	+8679

Table 6.7

The Index of Dissimilarity Relating to the Changes in the Composition of Female and Male School Leavers' Supply and Employment Between 1977 and 1983

	Index	
	Females	Males
Shares of School Leaver's Employment	3.34	1.79
Shares of All School Leavers in Labour Market	1.68	0.74

than the changes in the composition of their labour supply, and that both sets of changes were greater for females, than for males.

6.2.4. Summary

It was discovered in this section that the change in the level of school leavers' total employment was the main cause of the rise in both female and male school leavers' total, i.e. all levels of SCE attainment combined, non-employment between 1977 and 1983. However, the change in employment was not the major cause of the increase in non-employment experienced by school leavers at all levels of SCE attainment; at some of the upper levels of SCE attainment the change in supply was more important: for female school leavers with three or more Highers and male school leavers with four or five Highers, the increase in their non-employment was due to the increase in their supply exceeding the increase in their employment. It was also discovered that whilst the employment composition effect unequivocally added to the increase in non-employment experienced by the unqualified and less qualified and lessened the increase experienced by their better qualified peers, changes in the composition of school leavers' labour supply often offset, and occasionally overwhelmed, the employment composition effect, to leave a less equivocal relationship between the composition induced changes in school leavers' non-employment and their educational attainment than might be anticipated upon the basis of a study of employment trends alone. Finally, it appears that the composition of school leavers' employment changed to a greater extent than the composition of their labour supply, between 1977 and 1983, and that both sets of changes were greater for females than males.

6.3. The Shift-Share Decomposition of the Changes in the Composition of School Leavers' Employment at Each Level of SCE Attainment, 1977-83

6.3.1. Introduction

The aim in this section is to use the same shift-share technique as utilised in Chapter Four to examine the proximate sources of the changes, between 1977 and 1983, in school leavers' employment at each level of educational attainment. The results of the shift-share decomposition provide a way of gaining some leverage on the question of the relative roles played by changes in employers' hiring standards (as stressed by the proponents of the labour queue hypothesis) and changes in the occupational distribution of school leavers' employment (as stressed by proponents of the structural hypothesis) in causing changes in the composition of school leavers' employment.

The shift-share technique decomposes the composition induced changes in school leavers' employment, at each level of SCE attainment, i.e. the "net shifts", into the following three components.: firstly, that component attributable to the changes in the shares of school leavers' employment *within* occupations accounted for by school leavers at each level of SCE attainment, holding fixed the occupational distribution of school leavers' employment at its 1977 configuration. That is, the first component represents that part of the change in the composition of school leavers' employment that can be attributed to the changes in employers' hiring standards within occupational categories. The second component comprises that part attributable to the change in the occupational distribution of school leavers' employment, when the composition of school leavers' employment within each occupational category is held fixed at its 1977 configuration. That is, the second component represents that part of the change in the composition of school leavers' employment that can be attributed to occupational change. The final

component is that part attributable to the interaction of the first two components. These three components will be termed the qualification shift, the occupation shift and the interaction effects, respectively.[4]

6.3.2. The Shift-Share Decomposition of The Changes in The Composition of School Leavers' Employment

Table 6.8 shows the number of female and male school leavers estimated to have been in employment at each level of SCE attainment in 1977 and 1983. The figures in that table were calculated by grossing up SEDA estimates to population figures. These data form the basis for the shift-share decomposition.

Tables 6.9 and 6.10 show the results of applying the shift-share decomposition to the figures for female and male school leavers' employment, respectively.[5] It can be seen from the tables that the pattern of net shifts was the same for both genders, that is, negative shifts were experienced by the unqualified and least qualified, i.e. those with two O Grades or less in the case of females and those with one O Grade or less in the case of males, and positive net shifts were experienced by school leavers at all other levels of SCE attainment. The fact that the unqualified accounted for such a large proportion of the total negative net shifts (72% of female school leavers' total negative net shifts and 83% of male school leavers' total negative net shifts) suggests that the possession of any qualifications at all became an important determinant of whether school leavers gained employment.

The pattern of the net shifts differed between the genders. Female school leavers' positive net shifts were more concentrated among those with Highers than were male school leavers', which were more evenly spread among those with Highers and O Grades. In fact, nearly half of female school leavers' total

Table 6.8

The Estimated Number of School Leavers in Employment at Each Level of SCE Attainment in 1977 and 1983

SCE Attainment	1977		1983	
	Females	Males	Females	Males
1. Unqualified	10137	11354	2876	4313
2. O Grade Fails	3270	3278	1280	1595
3. One O Grade	2651	3737	1316	1794
4. Two O Grades	2321	2705	739	1885
5. Three O Grades	1718	2080	1028	1142
6. Four O Grades	1592	1487	992	1124
7. Five O Grades	940	1261	559	834
8. Six Plus O Grades	726	1516	469	1087
9. One Higher	1624	1590	1515	1178
10. Two Highers	1256	1401	1226	761
11. Three Highers	738	785	1316	598
12. Four Highers	433	493	685	507
13. Five Highers	128	212	325	272
14. Six Plus Highers	23	49	36	36
Total	27558	31949	14353	17126

Table 6.9

The Decomposition of the Observed Change in Female School Leavers' Employment 1977-83[1]

SCE Attainment	Observed Change	COMPONENTS OF OBSERVED CHANGE		COMPONENTS OF NET SHIFT		
		Level Effect	Net Shift	Qualification Shift Effect	Occupation Shift Effect	Interaction Effect
1. Unqualified	-7270	-4860	-2410	-1447	-1218	+254
2. O Grade Fails	-1990	-1570	-420	-282	-120	-19
3. One O Grade	-1336	-1272	-64	+91	+46	-201
4. Two O Grades	-1582	-1111	-471	-418	+104	-156
5. Three O Grades	-690	-824	+134	+78	+87	-31
6. Four O Grades	-601	-764	+163	+72	+160	-69
7. Five O Grades	-381	-446	+65	+45	+103	-83
8. Six Plus O Grades	-258	-349	+91	+33	+123	-65
9. One Higher	-109	-777	+668	+337	+262	+69
10. Two Highers	-30	-601	+571	+291	+186	+94
11. Three Highers	+579	-353	+932	+668	+138	+126
12. Four Highers	+252	-209	+461	+329	+51	+81
13. Five Highers	+196	-60	+256	+199	+3	+54
14. Six Plus Highers	+13	-11	+24	+4	+2	+18
All School Leavers	-13207	-13207	0	0	-73	+72

Notes:

(1) The net shifts, qualification shift effects and occupation shift effects should sum to zero down the columns. The fact that they do not do so results from the fact that that some cells which were filled in one of the SCE attainment by occupation matrices were empty in the other matrix.

Table 6.10

The Decomposition of the Observed Change in Male School Leavers' Employment, 1977-83(1)

SCE Attainment	Observed Change	COMPONENTS OF OBSERVED CHANGE		COMPONENTS OF NET SHIFT		
		Level Effect	Net Shift	Qualification Shift Effect	Occupation Shift Effect	Interaction Effect
1. Unqualified	-7040	-5273	-1767	-1632	-123	-11
2. O Grade Fails	-1683	-1522	-161	-255	+23	+72
3. One O Grade	-1943	-1738	-205	-285	+22	+57
4. Two O Grades	-820	-1254	+434	+338	+90	+7
5. Three O Grades	-939	-961	+22	+13	+8	+1
6. Four O Grades	-364	-688	+324	+376	+23	-75
7. Five O Grades	-427	-583	+156	+174	+42	-60
8. Six Plus O Grades	-429	-706	+277	+284	-61	+54
9. One Higher	-412	-737	+325	+330	-7	+2
10. Two Highers	-640	-647	+7	+11	-12	+7
11. Three Highers	-187	-364	+177	+206	-38	+8
12. Four Highers	+15	-229	+244	+129	+22	+94
13. Five Highers	+60	-96	+156	+234	+8	-86
14. Six Plus Highers	-12	-21	+9	+43	+3	-37
All School Leavers	-14821	-14819	-2	-34	0	+33

Note: (1) See Note (1) Table 6.13.

positive net shifts were accounted for by those with three Highers or more, whereas, only 43% of male school leavers' total positive net shifts were accounted for by all of those with Highers. So, female school leavers' net shifts were more polarised than male school leavers'.

Turning to the components of the net shifts, it can be seen from Tables 6.9 and 6.10 that the relative importance of the three components differed between the genders. In the case of male school leavers, the qualification shift effect was the largest component in absolute value at all levels of SCE attainment; except for those with two Highers, for whom the occupation shift effect was the largest component. In the case of female school leavers, the qualification shift effect was the largest component in absolute value at the highest and lowest levels of SCE attainment; but for those female school leavers with three or more O Grades but no Highers, the occupation shift effect was the largest single component. In fact, the larger average absolute value of female school leavers' net shifts principally reflected the larger average absolute value of their occupation shift effects.

It can be seen from Tables 6.9 and 6.10 that all the negative qualification shift effects were experienced by school leavers with low levels of SCE attainment and that the unqualified accounted for the vast majority of both gender's negative qualification shift effects (67% of female school leavers' and 75% of male school leavers' total negative qualification shift effects). The division of the total positive qualification shift effects between those with O Grades and those with Highers differed between the genders. In the case of male school leavers, the positive qualifications shift effects were relatively evenly spread between those with Highers and those with O Grades. In the case of female school leavers, those with three or more Highers accounted for the majority of their total positive qualification shift effects.

Turning to the occupation shift effect, from Table 6.9, it can be seen that, in the case of female school leavers, it was the unqualified and those with O Grade fails who experienced negative occupation shift effects. All the remaining, qualified, school leavers experienced positive occupation shift effects. The unqualified accounted for the vast majority of female school leavers' total negative occupation shift effects and for them the occupation shift effect was almost as large as the qualification shift effect. From Table 6.10 it can be seen that male school leavers' occupation shift effects showed no clear cut relationship with their SCE attainment, being negative for the unqualified and those in the middle of the SCE attainment scale and positive for the others.

Finally, it can be seen from Table 6.9 that in the case of unqualified female school leavers and those females with O Grade fails, negative occupation shift effects reinforced negative qualification shift effects. For all other female school leavers, with the exception of those with two O Grades, for whom a negative qualification shift effect overcame a positive occupation shift effect, positive occupation shift effects augmented positive qualification shift effects. For male school leavers, there was no clear relationship between the sign of the occupational and qualification shift effects and their SCE attainment.

6.3.3. Summary

The principal conclusions drawn in this section were: firstly, that female school leavers' net shifts were larger in average absolute value than male school leavers' because female school leavers' occupation shift effects were greater in average absolute value. Secondly, for both genders, it was the unqualified and least qualified who experienced negative net shifts. The pattern of the positive net shifts differed between the genders. In the case of female school leavers, it was those with Highers; especially those with three or more

Highers, who principally benefited from positive net shifts. In the case of male school leavers, the positive net shifts were more equally shared between those with O Grades and those with Highers. Thirdly, for both genders, the pattern displayed by the qualification shift effect was similar to, though more extreme than, that displayed by the net shifts. Fourthly, for both genders, the unqualified and least qualified accounted for the largest part of the total negative occupation shift effects. In the case of unqualified female school leavers, the occupation shift effect was a major component of their negative net shift. Finally, it was discovered that the qualification shift effect was, usually, more important than the occupation shift effect. This indicates that the raising of hiring standards within occupations was, overall, more important than changes in the occupational distribution of school leavers' employment in causing the bottom, but not the top, to drop out of their employment.

6.4. The Changes in School Leavers' Labour Supply, 1977–83

6.4.1. Introduction

The aim in this section is to apply the same shift-share decomposition as used in Chapter Five to the changes in school leavers' labour supply. Since the details of the shift-share technique are fully described in Chapter Five, they are not discussed here. The changes in school leavers' labour supply, at each level of SCE attainment, will be decomposed into three components: firstly, a component attributable to the change in the number of young people leaving school; secondly, a component attributable to changes in the labour market participation rate at each level of SCE attainment; and, finally, a component attributable to the changes in the SCE attainment of those leaving school. These components will be called the population level, the participation rate and the composition effects, respectively.[6]

Turning to a consideration of these components, changes in the number of young people leaving school in any year, i.e. the population level effect, changes the level of school leavers' labour supply in a straightforward manner. Changes in school leavers' labour market participation rates effect changes in their labour supply in a clear way: if school leavers' average labour market participation rate declined, then, *ceteris paribus*, so would the level of their labour supply. If labour market participation rates changed by differing amounts at each level of SCE attainment, then, *ceteris paribus*, this would have caused a change in the composition of their labour supply. Changes in school leavers' labour market participation rates can be seen as a discouraged worker/encouraged student effect in operation.[7]

Changes in school leavers' SCE attainment will affect both the level and composition of their labour supply. If school leavers' average SCE attainment increased, between 1977 and 1983, the level of their labour supply would have changed because participation rates tend to decline with SCE attainment. Also, changes in school leavers' average SCE attainment bring about changes in the composition of their labour supply in a straightforward way. Changes in school leavers' SCE attainment can be brought about either by pupils obtaining more qualifications in each school year, i.e. via increased "signalling" of ability (Spence, 1973), or, by young people staying-on at school to obtain extra qualifications, i.e. a signalling/discouraged worker effect.

By way of background, Figure 6.4 shows the number of school leavers in Scotland over the period 1961 to 1983.[8] It can be seen from that figure that the total number of school leavers in Scotland slightly declined between 1977 and 1983. Turning to school leavers' SCE attainment, Figures 6.5 and 6.6 are histograms showing the proportions of all school leavers accounted for by school leavers at each level of SCE attainment, in 1977 and 1983, for females

Figure 6.4 The Number of School Leavers, Scotland, 1961 to 1983

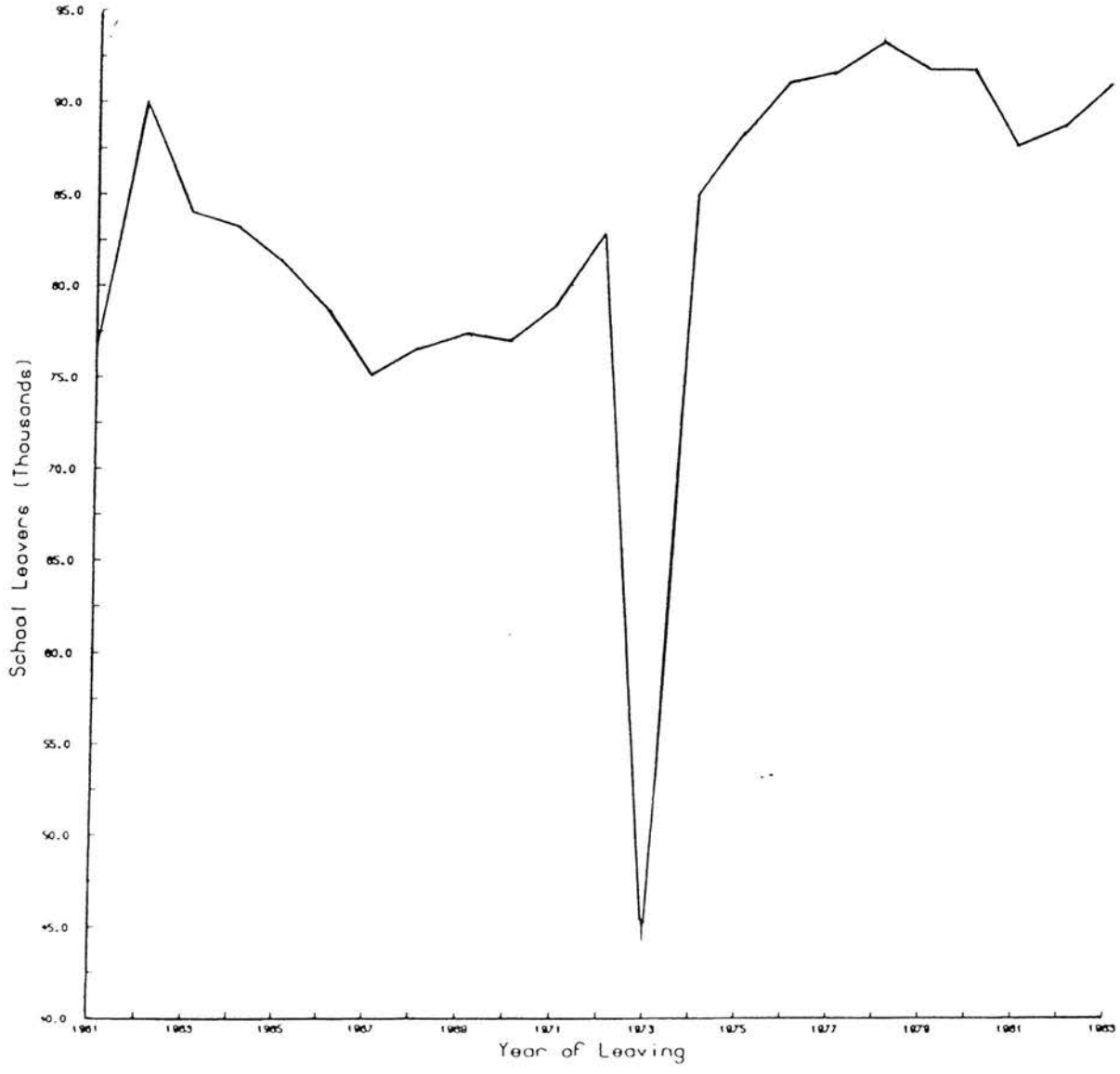


Figure 6.5 The SCE Attainment Composition of All Female School Leavers in 1977 and 1983

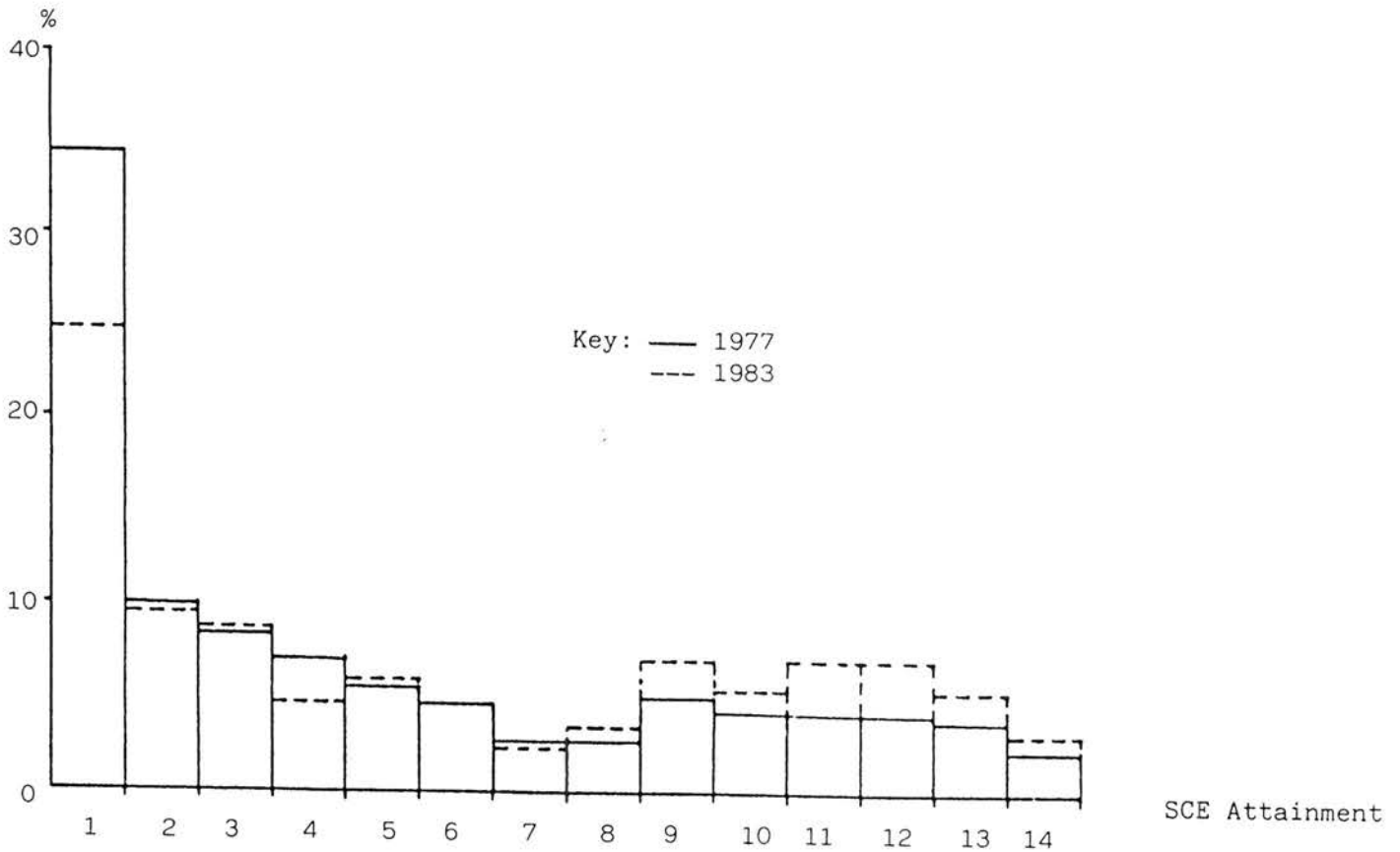
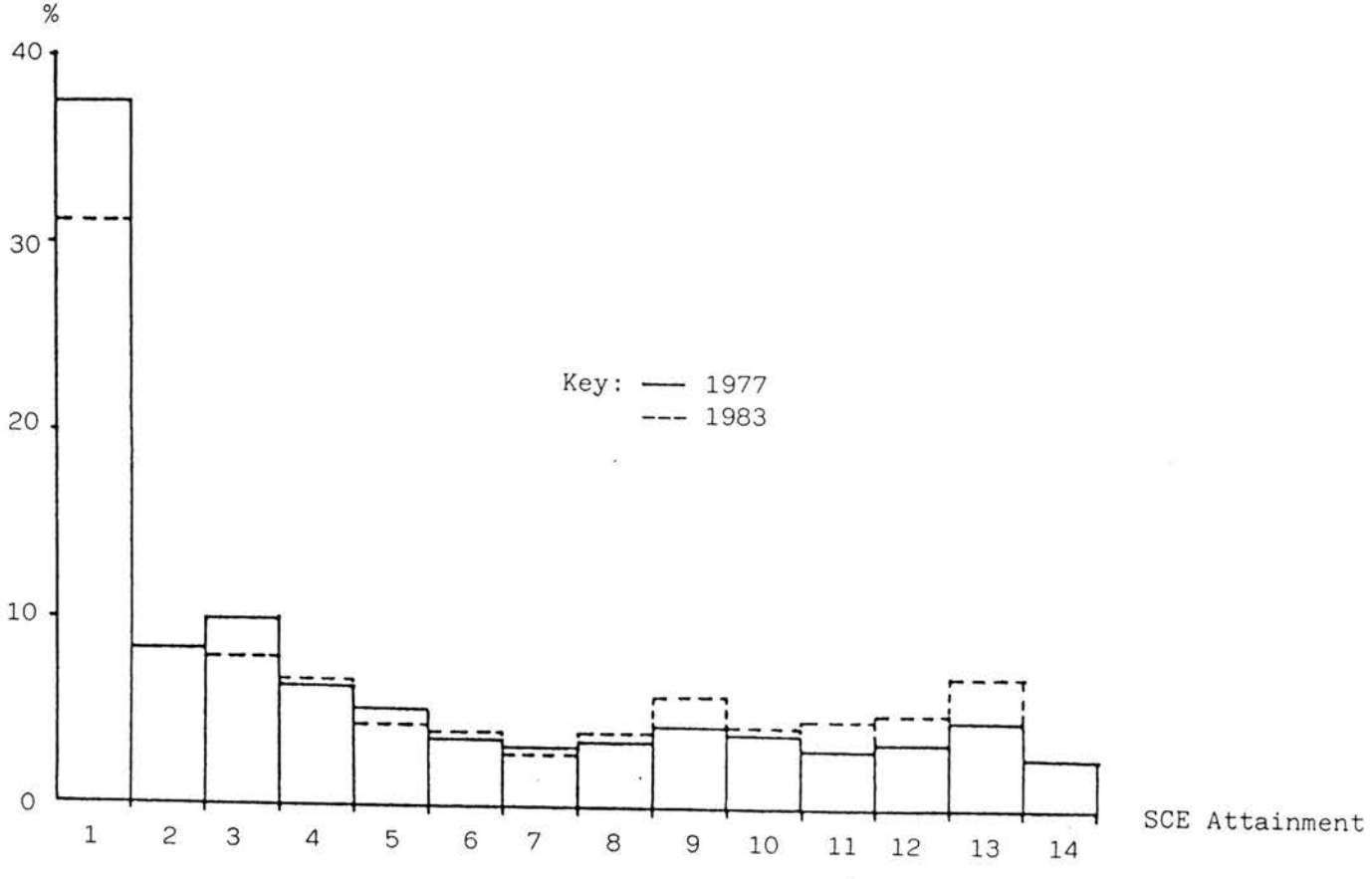


Figure 6.6 The SCE Attainment Level Composition of All Male School Leavers in 1977 and 1983



and males, respectively. It can be seen from the figures that the main change, for both genders, was a decline in the proportion accounted for by the unqualified and an increase in the proportion accounted for by those with Highers. It can be seen from the figures that these changes were greater for females than for males.

Turning to the consideration of the changes in participation rates, Figures 6.7 and 6.8 show female and male school leavers' labour market participation rates at each level of SCE attainment, in 1977 and 1983, and the difference between the 1983 and 1977 participation rates, respectively. It can be seen from the figures that participation rates gently declined with SCE attainment up until those with Highers whereafter they declined steeply. It can also be seen that female school leavers had a lower average participation rate than males. Turning to a consideration of the changes in participation rates, it can be seen from Figures 6.7 and 6.8 that the average participation rate fell, between 1977 and 1983, for both genders. The decline in the average participation rate was larger for males, i.e. down by 10.3 percentage points from 87.3% to 77%, than for females, i.e. down 8.8 percentage points from 78.7% to 69.9%. Finally, in the case of female school leavers, between 1977 and 1983, the participation rate increased among those with three or more Highers.

6.4.2. The Results of The Shift-Share Decomposition

Turning now to the results of the shift-share decomposition, Table 6.11 shows the results of applying the shift-share decomposition to the data for female school leavers. It can be seen from that table that, taken over all levels of SCE attainment, the largest component of the decline in their labour supply was the composition effect, to which 57.5% of their decline in supply can be attributed. The next largest component was the participation rate effect, to which a further 25.3% of their decline in supply can be attributed. The

Figure 6.7 Female School Leavers' Participation Rate at Each Level of SCE Attainment, 1977 and 1983

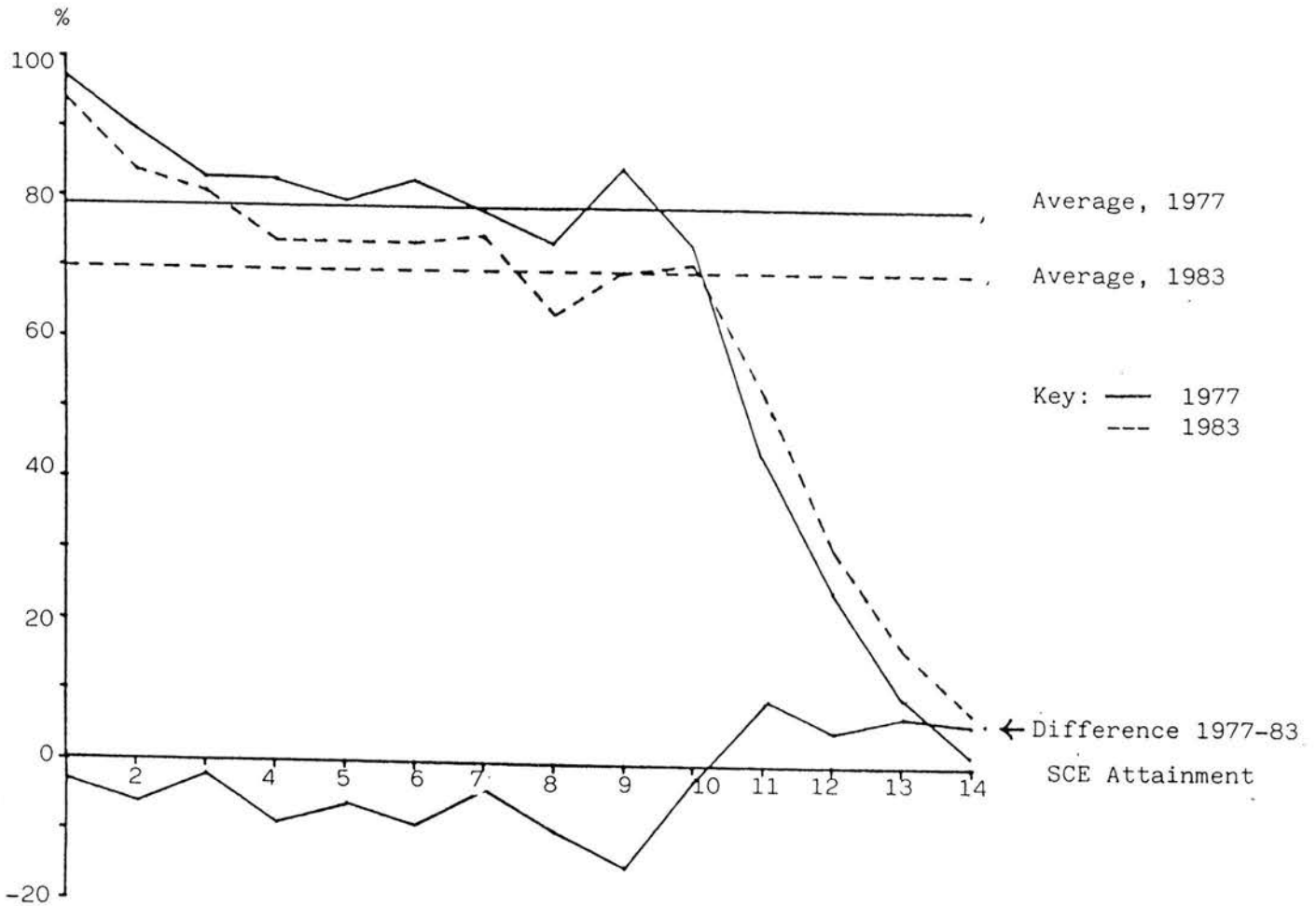


Figure 6.8 Male School Leavers' Participation Rate at each Level of SCE Attainment 1977 and 1983

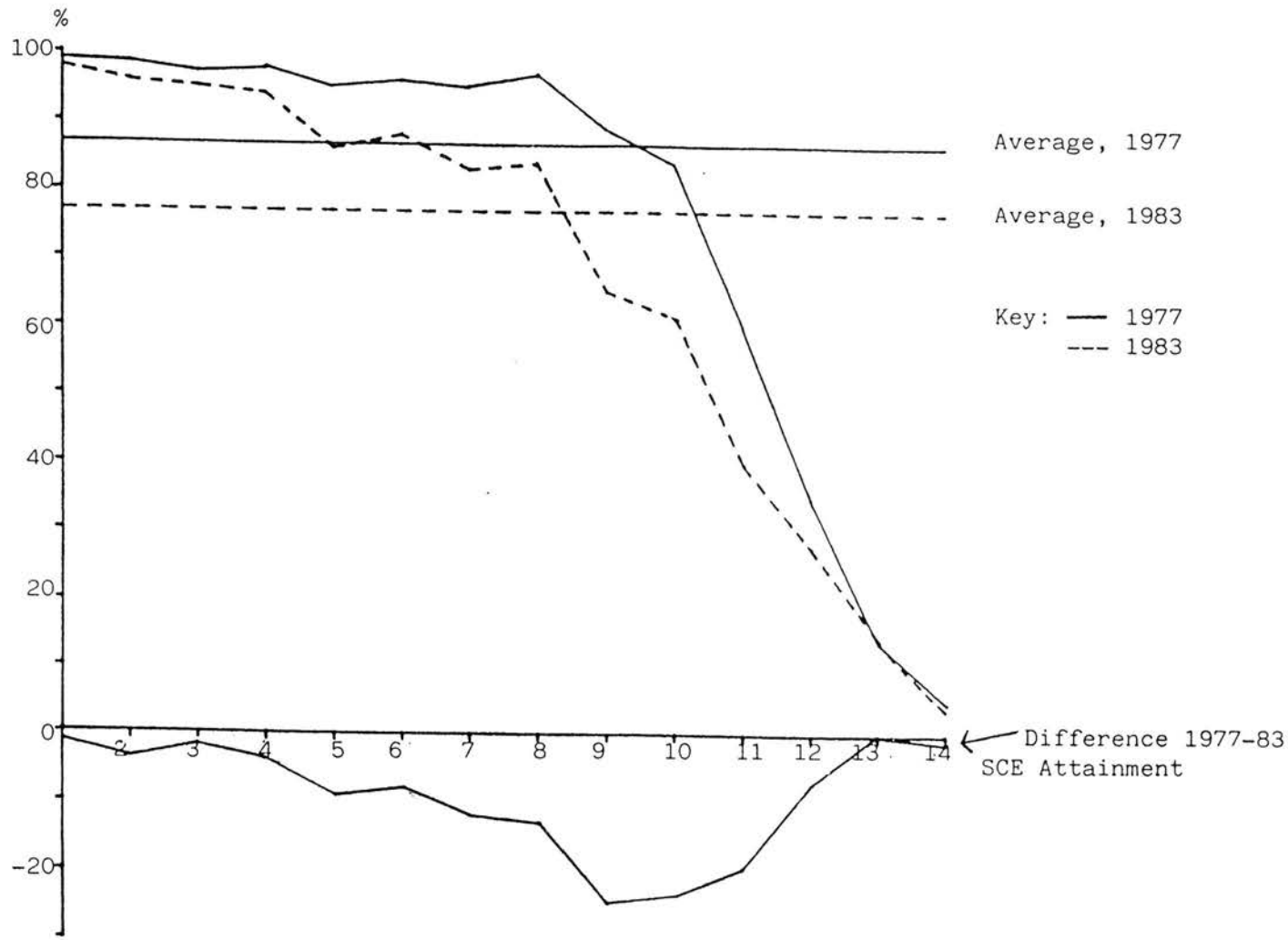


Table 6.11

The Decomposition of the Change in School Leavers' Supply of Labour to the Market, 1977-83, into The Population Level Effect, The Composition Effect and The Participation Rate Effect

SCE Attainment	Change in Supply	Population Level Effect	Composition Effect	Participation Rate Effect
1. Unqualified	-4443	-330	-3834	-279
2. O Grade Fails	-553	-90	-228	-235
3. One O Grade	-22	-71	+137	-87
4. Two O Grades	-987	-58	-729	-200
5. Three O Grades	-99	-44	+104	-159
6. Four O Grades	-265	-39	-39	-187
7. Five O Grades	-267	-23	-206	-38
8. Six Plus O Grades	+73	-19	+240	-148
9. One Higher	+300	-42	+791	-449
10. Two Highers	+219	-33	+315	-63
11. Three Highers	+710	-20	+460	+269
12. Four Highers	+456	-11	+292	+175
13. Five Highers	+254	-4	+79	+178
14. Six Plus Highers	+84	-1	+9	+76
All Levels of SCE Attainment	-4540	-783	-2609	-1148

remaining 17.2% can be attributed to the population level effect.

Table 6.12 shows the shift-share decomposition applied to the data for male school leavers. It can be seen from that table that, taken over all SCE attainment levels, the largest component of the decline in their labour supply, was the participation rate effect, to which 50.5% of their decline in supply can be attributed. The next largest component was the composition effect, to which a further 29.3% of the decline in their supply can be attributed. Finally, 20.3% of the decline in their supply can be attributed to the population level effect.

Finally, the general pattern for female school leavers, with some exceptions, was for the composition effect to be negative for those school leavers with five O Grades or less (with the exceptions of those with either one or three O Grades) and positive for those school leavers with either six plus O Grades or Highers. The participation rate effect was negative for those females with two Highers or less and positive for those with three or more Highers. For male school leavers, the composition effect tended, with some exceptions, to be negative for those with five O Grades or less (with the exceptions of those with two or four O Grades) and was positive for those with six plus O Grades and those with Highers. The participation rate effect was negative at all levels of SCE attainment (with the exception of those with five Highers, for whom it was zero).

6.4.3. Summary

It was discovered in this section that, between 1977 and 1983, for both genders, the composition and participation rate effects were more important than the population level effect in accounting for the changes in their labour supply. In the case of female school leavers, the largest component of the overall decline in their labour supply was the composition effect, whereas, in

Table 6.12

The Decomposition of The Change in Male School Leavers' Supply of Labour to The Market, 1977-83, into The Population Level Effect, The Composition Effect and The Participation Rate Effect

SCE Attainment	Change in Supply	Population Level Effect	Composition Effect	Participation Rate Effect
1. Unqualified	-3581	-530	-2794	-256
2. O Grade Fails	-311	-119	-68	-124
3. One O Grade	-974	-136	-717	-120
4. Two O Grades	-85	-91	+172	-167
5. Three O Grades	-583	-69	-317	-197
6. Four O Grades	-33	-51	+182	-164
7. Five O Grades	-278	-42	-68	-169
8. Six Plus O Grades	-116	-50	+176	-242
9. One Higher	-34	-56	+654	-632
10. Two Highers	-389	-47	+101	-443
11. Three Highers	+45	-25	+471	-401
12. Four Highers	+75	-18	+271	-178
13. Five Highers	+125	-9	+134	0
14. Six Plus Highers	-3	-2	+5	-6
All Levels of SCE Attainment	-6144	-1245	-1799	-3100

the case of males, it was the participation rate effect. This suggests that, on balance, males were more given to a straight-forward discouraged worker/encouraged student effect than females, who were more given to increasing their signalling activity within the secondary education system. So, between 1977 and 1983, school leavers appear to have actively adapted their supply behaviour in response to the deterioration in their employment prospects.

6.5. A Counter-factual Experiment

6.5.1. Introduction

The aim in performing the counter-factual experiment to be discussed in this section is to see if, in the absence of any decline in their level of employment or change in the composition of their labour supply, school leavers' non-employment would have increased as a result of structural changes producing a mismatch between the composition of the demand for, and supply of, their labour.

The counter-factual experiment consists of allowing for the changes in the composition of school leavers' employment and the population of school leavers but not allowing for the changes in either the composition of their labour supply or the level of their employment. The strong assumption is made that the changes in school leavers' average educational attainment and participation rates were induced by the decline in their employment, and since the decline in their level of employment is not allowed for, neither are they.

The procedure is as follows: four non-employment rates are calculated by summing the difference between school leavers' supply and employment at each level of SCE attainment. The first rate is computed assuming the 1977 composition of school leavers' employment. This first non-employment rate is

here called the "baseline rate". The second rate allows for the entire change in the composition of school leavers' employment between 1977 and 1983. The third rate allows for only those changes in the composition of school leavers' employment which were brought about by changes in the occupational distribution of their employment. The fourth, and final, rate allows only for the changes in the composition of school leavers' employment which were brought about by the raising of hiring standards within occupations. Finally the four non-employment rates are compared.

6.5.2. The Results of The Counter-factual Experiment

Table 6.13 shows the results of the counter-factual experiment. It can be seen from the table that the effect of allowing for the full change in the composition of school leavers' employment, between 1977 and 1983, would have been to increase female school leavers' non-employment rate by 15.9 percentage points above the baseline rate, and result in 5424 unfilled vacancies. In the case of males, the calculated effect is less dramatic, their non-employment rate would have increased by 8 percentage points above the baseline rate and there would have been 3138 unfilled vacancies. The higher non-employment rates result from greater non-employment among the unqualified and less qualified, whilst the unfilled vacancies are for well qualified school leavers.

It can be seen from Table 6.13 that it is calculated that the effect of only those changes in the composition of school leavers' employment that can be attributed to changes in their occupational distribution of employment, would have been to increase female school leavers' non-employment rate by 3.7 percentage points above the baseline rate and to have increased male school leavers' non-employment rate by only one percentage point above their baseline rate.[9] It is also calculated that there would have been 1274 unfilled

Table 6.13

Counterfactual Estimates of Scottish School Leavers' Nonemployment Allowing Only the Composition of Demand to Alter

	1977 Participation Rates	
	Females	Males
(1) Total in Labour Market	34201	39463
(2) Total in Employment	27558	31949
(3) (1) - (2)	6643	7514
(4) Assuming 1977 Composition of Demand		
(i) Nonemployment	6643	7514
(ii) Excess Demand ie Unfilled Vacancies	0	0
(iii) Baseline Nonemployment Rate (%)	19.4	19.0
(5) Assuming 1983 Composition of Demand:		
(i) Nonemployment	12067	10652
(ii) Excess Demand ie Unfilled Vacancies	5424	3138
(iii) Nonemployment Rate (%)	35.3	27.0
(6) Assuming 1977 Composition of Demand Amended by Allowing for the Occupation Shift Effect Only:		
(i) Nonemployment	7917	7536
(ii) Excess Demand ie Unfilled Vacancies	1274	22
(iii) Nonemployment Rate (%)	23.1	20.0
(7) Assuming 1977 Composition of Demand Amended by Allowing for the Qualification Shift Effect Only:		
(i) Nonemployment	9622	10733
(ii) Excess Demand ie Unfilled Vacancies	2979	3219
(iii) Nonemployment Rate (%)	28.1	27.2

vacancies for female school leavers and only 22 unfilled vacancies for male school leavers.

It can be seen from Table 6.13 that the effect of only those changes in the composition of school leavers' employment that can be attributed to changes in employers' hiring standards would have been to increase female school leavers' non-employment rate by 8.7 percentage points above their baseline rate and to have increased male school leavers' non-employment rate by 8.2 percentage points above their baseline rate. It is also calculated that there would have been 2979 unfilled vacancies for female school leavers and 3219 unfilled vacancies for male school leavers.

6.5.3. Summary

If the only development, between 1977 and 1983, apart from the change in the population of school leavers, had been the actual change in the composition of school leavers' employment, then, it is calculated that both female and male school leavers' non-employment rates would have substantially increased. If the only development, apart from the population change, had been the changes in the occupational distribution of school leavers' employment, then, it is calculated that there would only have been a small increase in female school leavers' non-employment rate and a modest increase in male school leavers' non-employment. If the only development, apart from the population change, had been the raising of employers' hiring standards, then, it is calculated that there would have been quite a large increase in male and female school leavers' non-employment rates. Of course, this last result is somewhat problematic, because, it is argued by the proponents of the labour queue hypothesis that the changes in employers' hiring standards resulted from a situation of demand deficiency and the resulting decline in employment, and, of course, the decline in school leavers'

total employment is not allowed for in Table 6.13.

6.6. Conclusion

The aim in this Chapter was to examine the claim that the bottom but not the top had dropped out of the youth labour market. It was discovered that, as far as Scottish school leavers' employment was concerned, this claim is substantially true. However, the central argument here has been that one needs to look at both sides of the labour market, that is, supply as well as demand; since the real concern is with young peoples' non-employment. Furthermore, school leavers' labour supply behaviour can not be regarded as given; school leavers adapted their supply behaviour in response to the decline in their employment prospects. By mainly concentrating upon young peoples' employment, the structural and labour queue hypotheses have come close to ignoring half the story.

The results of the shift-share decomposition of the rise in Scottish school leavers' non-employment, at all levels of SCE attainment taken together, showed that the decline in the level of their employment was the major proximate cause. However, the change in employment was not the most important factor at all levels of SCE attainment: some of the better qualified school leavers saw their non-employment increase because the increase in their supply outstripped the increase in their employment. The compositional changes in school leavers' employment unequivocally added to the increase in non-employment experienced by the unqualified and least qualified, whilst they lessened the increase in non-employment experienced by the better qualified. The compositional changes in school leavers' labour supply often offset, and occasionally overwhelmed, the changes in the composition of their employment to leave a less clear cut relationship between the composition induced changes in their non-employment and their educational attainment than might have

been anticipated on the basis of a study of employment trends alone.

The examination of the proximate sources of the change in the composition of school leavers' employment showed that the raising of hiring standards within occupations was, usually, a more important factor than occupational change in causing the bottom, not the top, to drop out of school leavers' employment. Some evidence to support the structuralist hypothesis, was provided by the fact that unqualified female school leavers experienced a large negative occupation shift; however, it was not only the better qualified female school leavers who gained from such changes, since the gains were relatively evenly spread among all qualified female school leavers.

The results of the shift-share decomposition of the changes in school leavers' labour supply showed that the decline in the population of school leavers contributed the smallest part to the changes in their labour supply. For females, the composition effect was the largest component, whilst for males the participation rate effect was largest. These results suggest that, on balance, males were more given to a straightforward discouraged worker/encouraged student effect than females, who were more given to increasing their signalling activity within the secondary education system. So, it was shown that, over the period 1977-83, school leavers significantly altered their supply behaviour in response to a dramatic decline in their employment prospects.

The results of the counter-factual experiment indicated that the changes in the composition of school leavers' employment attributable to changes in the occupational distribution of their employment would not have added much to school leavers' non-employment, by way of a compositional mismatch between their labour supply and employment, in the absence of the changes in school leavers' total employment and changes in employers' hiring standards.

Furthermore, given that the observed changes in the occupational distribution of school leavers' employment also reflected the uneven impact of demand deficiency across industries (see Chapter Four) and occupations, the modest role above attributed to structural change is still likely to be an exaggeration of its true, purely secular, effect.

Finally, if one feels some sympathy for school leavers, because of the increasing difficulties they faced in securing employment between 1977 and 1983, one must surely feel even more sympathy for unqualified and less qualified school leavers, who initially faced quite large difficulties in 1976/77 and who, by 1982/83, faced immense difficulties.

Footnotes

1. The increase in Scottish school leavers' non-employment, between 1977 and 1983, is herein assumed to have reflected an increase in their involuntary non-employment, i.e. their inability to find a job even though they were willing to work at the prevailing level of real wage rates. There do not appear to be any a priori reasons for supposing that school leavers should have chosen to increase the extent of their voluntary unemployment between 1977 and 1983.

   The increase in school leavers' non-employment is also unlikely to be attributable to an increase in their frictional unemployment, since Raffe (1984a) produced evidence to show that Scottish school leavers had reduced their aggregate rate of job changing between 1977 and 1983.

   Finally, since the evidence suggests (see Chapter One; and, Wells, 1984) that young peoples' relative pay declined after 1979, it seems likely that none of the increase in their non-employment is due to the increase in their relative pay.

2. It is assumed throughout this Chapter that school leavers' employment was demand determined, so that changes in the demand for school leavers' labour were manifested as changes in their employment. This is consistent with the findings of the econometric studies reviewed in Chapter One, namely, that the youth labour market, as a whole, appears to have been in chronic disequilibrium for many years and that since the early 1970's it seems to have been characterised by excess supply.

   From Table 6.1 it can be seen that some of the better qualified school leavers had very low rates of non-employment in 1977. These low rates are not inconsistent with equilibrium in a youth labour market (see Chapter Seven). However, such school leavers experienced both an increase in their employment and their non-employment between 1977 and 1983. This suggests that between 1977 and 1983 their employment became demand determined. Therefore, the *changes* in their employment may be regarded as synonymous with the *changes* in the demand for their labour.

   When considering the demand for labour, it is usual to define it so as to include unfilled vacancies as well as employment. The SEDA contains no data on unfilled vacancies and so unfilled vacancies will have to be ignored in most of the following analysis (but see Section 6.5). Inclusion of such data would only have altered the results to the extent that the number of unfilled vacancies *changed* between 1977 and 1983. Evidence from the 1981 survey of Scottish school leavers (Main and Raffe, 1983b) suggests that by the spring of the year following that in which the SEDA sample left school, i.e. at the time when the survey was conducted, there were very few previously non-employed school leavers gaining jobs. This suggests that there were few unfilled vacancies for school leavers at that time and that the change in the number of unfilled vacancies between 1977 and 1983 was not very large; consequently, ignoring unfilled vacancies will not cause too many problems.

3. The total number, i.e. population, of school leavers in Scotland in 1977 and 1983 were 91,100 and 88,600 respectively (SAS, 1985).

4. Since the computational details of this particular variant of the shift-share technique were discussed in Chapter Four, they are not discussed here. The qualification shift and occupation shift effects in Section 6.3 correspond to the occupational composition shift and industry shift effects discussed in Chapter Four.

5. A problem occurred in the calculations involved in the shift-share decomposition. It was found that some cells which were filled in the 1977 SCE attainment level by occupation matrix were empty in the 1983 matrix. This resulted from the fact that the 1983 matrix was constructed using a smaller sample than the 1977 matrix. The effects of this empty cell problem are, firstly, to prevent the net shifts, qualification shifts, occupation shifts and interaction effects from summing to zero across all SCE levels and, secondly, to allocate all of the net shift within an educational attainment level/occupational cell to either the qualification shift or occupation shift effect.

   Also, when reading the discussion of results in the main text, the problems caused by sampling variation and the need to convert school leavers' occupations to a common classification should be borne in mind (see Chapter Four).

6. The population level, composition and participation rate effects correspond to the components relating to the decline in all ages' total employment, structural change and the changes in industry's recruitment ratios discussed in Chapter Five.

7. The so-called "discouraged worker effect" relates to a situation in which a decline in the level of aggregate demand is associated with a decline in the labour market participation rate of a group of workers. When aggregate demand declines, unemployment rises, and this reduces school leaver's chances of getting a job, as well, perhaps, as the real wages of those school leavers in employment; (due to less overtime work, smaller productivity bonuses etc.) This set of events will cause two opposing effects. Firstly, the rise in unemployment, and possible fall in real wages, will tend to have the effect of reducing household's average incomes, and greatly reducing certain household's income in particular. Households might respond to this decline in income by encouraging young people of working age to enter the labour market and seek work, rather than continuing in school or continuing into tertiary education. Secondly, the decline in young people's employment chances, and possible decline in real wages, may lead households to decide that young people should continue in school or into tertiary education, because the returns to job seeking, and hence the opportunity cost of continued education, have declined.

   If the first, income, effect predominates then school leavers' participation rates will tend to increase, and they will tend to leave school earlier, as their non-employment increases, i.e. the "added worker" effect will be observed. If on the other hand, the second, substitution, effect predominates then school leavers' participation rates will tend to decrease, and they will tend to leave school later, in response to an increase in their non-employment, i.e. the "discouraged worker effect" will be observed.

8. The dip in Figure 6.4 in 1973 was caused by the raising of the minimum school leaving age from 15 to 16.

9. No allowance need be made for the interaction effect here because either only the occupational distribution of school leavers' employment or only the composition of their employment within occupations is allowed to change at a time.

CHAPTER 7
SCOTTISH YOUNG PEOPLE'S PROBABILITIES OF CONTINUING INTO FULL-TIME TERTIARY EDUCATION, 1979 TO 1983.

7.1. Introduction

7.1.1. Preface

The aim in this Chapter is to examine the determinants of Scottish school leaver's decisions as to whether to continue in the educational system at the end of their secondary schooling, and, in particular, to examine the role played by their expectations of their employment prospects in influencing their decisions. This examination will be undertaken via a process of econometric estimation involving the fitting of a probit equation relating to school leaver's probabilities of continuing into full-time tertiary education at the end of their secondary schooling.

The study of the determinants of young people's decisions as to whether to continue in full-time tertiary education is of interest for a number of reasons. Firstly, Rice (1985), in her recent study of household investment in post-compulsory schooling in the U.K., draws attention to the fact that Britain has one of the lowest proportions of 16-24 year olds in full-time education among the OECD countries. Given that, as noted in Chapter Two, the lack of adequately trained manpower has been argued (Prais, 1983) to have handicapped British manufacturing firms in their competition with foreign manufacturing firms and given that it is anticipated that future occupational trends will cause a shift in all ages' employment towards professional, technical and skilled occupations (Parsons, 1985; Elias and Wilson, 1986; Rajan and Pearson, 1986), it is clear that the future prosperity of Britain is inextricably linked to the education of its young people. Consequently, the study of the determinants of young people's decisions whether to undertake tertiary

education is important if anything is to be done to rectify Britain's present perceived deficiencies and to enhance the nation's future prosperity.

Secondly, in a sense, the proportion of school pupils continuing into tertiary education can be seen as one measure of the success of the educational system. That is, an educational system which can produce young people capable of progressing in education beyond the minimum compulsory level and a system that can also meet the demand by young people for such post-compulsory education can be seen as successfully fulfilling its role. Consequently, the study of young peoples' demand for tertiary education can also be seen as a study of the effectiveness of the educational system, and given that the effectiveness of the educational system is a topic of considerable political interest at present this perspective adds a further interest to the contents of this Chapter.

Thirdly, the decision to undertake tertiary education has important implications for young people's future prosperity because individuals' incomes rise with, and the proportion of their working lives during which they might be expected to be unemployed decreases with, educational attainment (Ashenfelter and Ham, 1979; Nickell, 1979; Psacharopoulos and Layard, 1979). Consequently, those young people who undertake tertiary education can reasonably be expected to enjoy higher lifetime earnings than those who do not[1] and the study of the determinants of young people's decisions whether to continue in full-time tertiary education therefore has a welfare dimension, namely, it represents a study of one of the ways in which life chances are distributed across individuals.

Fourthly, the dramatic rise in Scottish school leavers' non-employment in the late 1970's and early 1980's was, as we shall see, accompanied by an

increase in the proportion of school leavers who chose to continue in full-time tertiary education and it will be argued below that this, in part, reflected the effect of the decline in school leaver's employment prospects in discouraging their labour market participation. If those school leavers who were discouraged from labour market entry had entered the labour market, school leavers' recorded non-employment would have been that much higher. The contents of this Chapter therefore represent an aspect of the study of the increase in Scottish school leavers' non-employment.

Fifthly, the contents of this Chapter can be viewed as a contribution to the body of literature relating to young people's post-compulsory educational investment decisions. (This literature is reviewed in Section 7.2 below.) The contents of this Chapter should also represent a noteworthy contribution to this literature by virtue of the large sample employed, and because of the novel way in which school leaver's employment prospects are incorporated into the analysis.

Finally, in recent years, the question of the likely number of young people entering higher education in the future has become quite a contentious issue (Moore, 1983), and, although the contents of this Chapter are not restricted to the decision to continue in higher education alone, it is hoped that they might contribute something to this debate.

It was originally hoped that it would be possible to examine school leaver's staying on behaviour, i.e. staying on at school beyond the end of compulsory schooling, since there was a marked change in staying on behaviour in Scotland in the late 1970's and early 1980's (SED, 1986) and because the decision to stay on at school and the decision to continue into full-time tertiary education are obviously linked (see Pissarides, 1982; on this point).

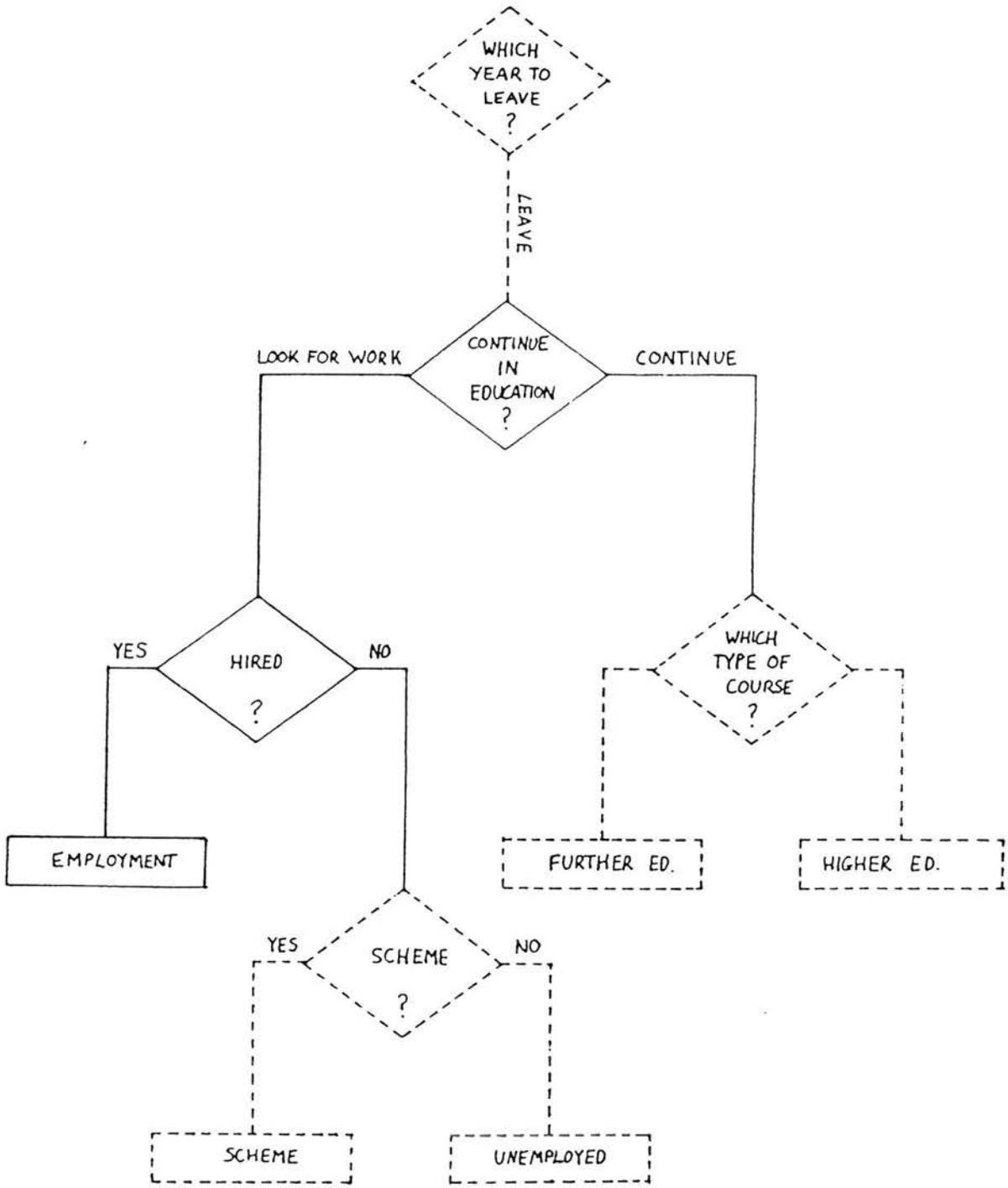
Unfortunately, it is not possible, using the SEDA data, to create a sample of school leavers all of whom contemporaneously made their staying on decisions. The two reasons why it was not possible to create such a sample are discussed in Appendix 7.1. Briefly, they are, firstly, that the SEDA data set does not contain a true age/stage cohort and, secondly, that there is no control group for fifth form leavers. So, unfortunately, it is not possible to model Scottish school leaver's staying on behaviour.

The analysis contained in this Chapter draws on data from the 1979, 1981 and 1983 Scottish School Leavers Surveys. The data from the 1977 survey was not included for three reasons. Firstly, because a major concern in this Chapter lies in examining the role played by school leaver's employment prospects in determining their decisions as to whether to continue into full-time tertiary education and school leavers' total employment actually increased between 1977 and 1979. Secondly, by not using data from the 1977 survey, the analysis can be conducted using data relating to the whole of Scotland not just the four regions of Strathclyde, Lothian, Fife and Tayside. Finally, not using the 1977 data considerably eased the task of econometric estimation.

7.1.2. A Schematic Introduction to School Leaver's Transitions and a Preview of the Model to be Estimated

Upon leaving school, the vast majority of young people either enter the labour market or continue in full-time tertiary education.[2] Among those school leavers who enter the labour market, some will find work and some will become unemployed or enter state schemes for the unemployed.[3] The above described process is shown in Figure 7.1 which is laid out as a flow diagram showing the various decisions that young people, employers and administrators of government schemes for the young unemployed made during young people's transitions from the end of their secondary schooling to their eventual

Figure 7.1: Young People's Post-School Destinations



post-school destinations. The full lines in Figure 7.1 indicate those decisions which are to be modelled in this Chapter.

The transition process is assumed to operate in the following manner. At sometime before the end of their secondary schooling, young people decide whether to proceed into full-time tertiary education or enter the labour market. It is assumed that young people's expectations of their chances of getting a job if they chose to enter the labour market will affect their decisions. If a young person decides not to continue in full-time tertiary education and decides instead to enter the labour market and seek employment, they will then apply for jobs and subsequently either be found in employment or not found in employment, according to the outcome of employers' hiring decisions and their decisions as to whether to accept employers' job offers.

The model of the transition process utilised in this Chapter is a three equation model which, by the assumption of rational expectations[4] on the part of school leavers, can be re-expressed as a two equation model. The three equations are: firstly, an equation for school leaver's expectations of their chances of getting a job, should they choose to enter the labour market; secondly, an equation relating to school leaver's decisions as to whether or not to continue in full-time tertiary education; and, finally, an equation relating to school leaver's actual employment chances. The assumption of rational expectations allows the first and third equations to be regarded as equivalent, leaving only two equations to be estimated.

The above described model is an example of a sequential-response model (Maddala, 1983). Such models relate to a series of binary decisions taken one after another. In the present case, the series of decisions are: firstly, school leaver's decisions whether to enter the labour market and, secondly, employers'

subsequent decisions as to which school leavers to hire. Sequential-response models are easy to handle econometrically, so long as it is appropriate to assume that the probability of choice at each stage is independent of choices made at previous stages. Since different groups made the two decisions considered here, i.e. school leavers and employers respectively, the two decisions should be independent.

7.1.3. The Changes in Scottish Young People's Post-School Destinations, 1979-83

The aim in this sub-section is to examine the increase in the relative importance of continued full-time tertiary education as a post-school destination for Scottish young people. To that end, Table 7.1, shows the percentage of male and female school leavers in continued full-time tertiary education, the labour market and "other" category in 1979, 1981 and 1983.[5] Those school leavers in the labour market have been further divided according to whether they were in employment or were non-employed (the non-employed comprise those on schemes and those unemployed). It can be seen from Table 7.1 that female school leavers displayed a greater propensity, to continue in full-time tertiary education than male school leavers in each of the three years. It can also be seen that the proportion of school leavers choosing to continue into full-time tertiary education increased by seven percentage points, in the case of male school leavers, and by nine percentage points, in the case of female school leavers, between 1979 and 1983. This sharp increase in the proportion of school leavers of either gender choosing to continue into full-time tertiary education also coincided with a sharp decline in their employment prospects.

Table 7.2 shows Scottish young people's post-school destinations broken down according to whether they left before or after the Christmas of the fifth

Table 7.1

Scottish School Leavers' Post-School Destinations in 1979, 1981 and 1983

Survey	1979		1981		1983	
	M	F	M	F	M	F
Destination						
1. Continued Education	15.4	22.4	18.7	25.3	22.4	31.4
2. Labour Market:	81.2	74.6	80.6	72.8	74.6	61.4
Employment	67.5	62.2	52.0	48.1	41.9	34.5
Nonemployment	13.7	12.4	28.6	24.7	32.7	29.9
3. Other	3.1	3.0	0.7	1.8	3.0	5.2
Gender split	51.2	48.8	50.9	49.1	51.2	48.8
Unweighted N's	3987	4225	5124	5621	3530	3413

Table 7.2: Scottish School Leavers' Post-School Destinations According To When They Left School and Gender 1979, 1981 and 1983.

Survey:	1979		1981		1983	
Gender:	M	F	M	F	M	F
EARLY SCHOOL LEAVERS						
1. Continued Education	2.2	10.7	2.0	8.9	3.6	14.4
2. Labour Market:	96.6	87.1	97.6	88.9	93.9	80.3
Employment	77.8	69.8	57.9	51.2	49.1	35.3
Nonemployment	18.8	17.3	39.7	37.7	44.8	45.0
3. Other	1.2	2.2	0.4	2.2	2.6	5.3
LATE SCHOOL LEAVERS						
1. Continued Education	42.8	43.7	33.8	37.9	47.1	46.6
2. Labour Market:	50.2	51.7	65.3	60.6	49.4	48.4
Employment	46.8	48.2	46.7	45.8	32.5	33.8
Nonemployment	3.4	3.5	18.6	14.8	16.9	14.6
3. Other	7.0	4.6	0.9	1.5	3.5	5.1
Unweighted N's	3987	4225	5124	5621	3530	3413

form and according to gender. Scottish school leaving arrangements imply that the latest stage at which young people who left at their earliest possible opportunity could leave school is Christmas of the fifth form.[6] This means that those young people who are still in school after Christmas of their fifth form have *volunteered* to continue in secondary schooling and those that leave at or before Christmas of their fifth form have either taken their first opportunity to leave or have only volunteered for at most a few month's extra schooling. Those who left at or before Christmas of the fifth form will be called "early" leavers and those who left after Christmas of the fifth form will be called "late" leavers. It is to be anticipated that there will be important differences in the attitudes of the two groups of school leavers with regard to continuing in full-time tertiary education, since one group has already volunteered for an extra educational investment. Furthermore, those school leavers who left school after Christmas of their fifth form will on average tend to be older than, and possess more educational qualifications than, their peers who left as soon as they could. It is these differences in the average possession of educational qualifications and age; and also in school leaver's attitudes, which it is contended, cause the differences in the two groups' propensities to continue in full-time tertiary education.

It can be seen from Table 7.2 that late leavers had a much greater propensity to continue into full-time tertiary education than early leavers. Among early leavers, females displayed a much greater propensity to continue into full-time tertiary education than males. Among late school leavers, the gender difference was not as marked. Finally, among male and female, early and late school leavers, the proportion continuing into full-time tertiary education increased between 1979 and 1983.

Since the increase in the proportion of school leavers continuing into

full-time tertiary education occurred at the same time as a marked decline in their employment prospects it seems natural to wonder if the two sets of changes might be linked. Considering Great Britain as a whole, Figure 7.2, shows the percentage of young people aged 16 to 18 years who were out of school and in further education, i.e. full-time and sandwich courses including higher education but excluding private education outwith school, in January of each year, between 1974 and 1984, plotted along with the average annual ages unemployment rate in the previous year. The previous year's all ages unemployment rate is used in order to take account of the fact that young people would have made their decisions whether to enter further education in that year.

It can be seen from Figure 7.2 that there appears to have been a close correspondence in the direction of change between the proportion of out of school 16 to 18 year olds in further education and the all ages unemployment rate, until 1984. The change in the relationship in 1984 may have been related to the introduction of The Youth Training Scheme (YTS) in April 1983; the scheme may have given young people a new opportunity to acquire human capital in the labour market and lessened the appeal of further education.[7]

Turning back to the SEDA data, Table 7.3 shows the proportion of all those school leavers in the labour market who were found to be either in employment or non-employment, broken down according to when they left school and their gender, in each survey year. It can be seen from that table that a much greater proportion of late school leavers than early school leavers were found to be in employment, irrespective of gender and survey year. It can also be seen that the proportions recorded as being in employment declined between each survey year, irrespective of gender and when young people left school.

Figure 7.2: The Percentage of Young People Aged 16 to 18 Years Old Who Were Out of School and Who Were Engaged in Further Education(1) in January of Each Year Plotted With The Average Annual All Ages' Rate of Unemployment in The Previous Year, Great Britain, 1974 to 1984.

Note: (1) Further education is defined as full-time and sandwich cources, including higher education but excluding private education outside school.

Sources: (1) Further education data: DES (1985), Tables 5 and 6.
(2) Unemployment rate data: Annual Abstract of Statistics, Nos 119 & 121, 1983 & 1985, Tables 6.8 & 6.6.

Table 7.3: Scottish School Leavers Labour Market Destinations According to When They Left School and Gender: 1979, 1981 and 1983

Survey:	1979		1981		1983	
Gender:	M	F	M	F	M	F
EARLY SCHOOL LEAVERS						
Employment	80.5	80.1	59.4	57.6	52.3	43.9
Nonemployment	19.5	19.9	40.6	42.4	47.7	56.1
LATE SCHOOL LEAVERS						
Employment	93.2	93.3	71.5	75.6	65.7	69.8
Nonemployment	6.8	6.7	28.5	24.4	34.3	30.2
Unweighted N's	3366	3335	3928	3891	2572	2161

To summarise the above, it appears that young people's decisions to continue in full-time tertiary education were affected by their gender, their educational experience prior to leaving school and that there appears to be a time-series relationship between young people's employment prospects and their decisions whether to continue in full-time tertiary education. One of the aims in this Chapter is to see if an equivalent cross-section relationship existed.

7.1.4. The Rest of the Chapter

The general outline of the rest of this Chapter is as follows: Section 7.2 contains a short survey of the relevant empirical literature. Section 7.3 contains an exposition of the models of school leaver's decisions as to whether to continue in full-time tertiary education and employers' hiring of school leavers. Section 7.4 contains a discussion of estimation issues, the data to be employed and the variables to be used in estimation. Section 7.5 contains the estimation results. Finally, Section 7.6 contains the conclusions.

7.2. A Short Survey of The Literature

7.2.1. Introduction

There are two aims in presenting this literature survey. The first is to examine previous work in order to help decide which variables should be included in the probability of employment and probability of continued full-time tertiary education equations. The second aim is to explain why the effects of family background characteristics on school leaver's decisions whether to continue in full-time tertiary education might be expected to be somewhat attenuated, due to prior sorting of individuals within the educational system. The literature survey contained in this section is, therefore, highly focused and is not intended as a general review. Finally, the details concerning individual

studies are relegated to footnotes.

7.2.2. Young People's Employment

Econometric studies of the determinants of young people's employment prospects (Main and Raffe, 1983b; Raffe, 1984f; Main, 1985a,b; Payne and Payne, 1984; Breen, 1984; and Breen, 1986) found that young people's probabilities of employment were positively related to indicators of their attractiveness as potential workers, e.g. educational qualifications, age and previous work experience, and also to measures relating to conditions in the labour market, e.g. youth unemployment and local all ages' unemployment.[8] Consequently, when modelling young people's probabilities of employment, their gender, age and educational qualifications, as well as conditions in their local labour market, will be taken into account.

7.2.3. Young People's Post-Compulsory Educational Investments

Econometric studies of young people's decisions whether to continue in school at the end of their compulsory schooling and of young people's decisions whether to continue into full-time tertiary education at the end of their secondary schooling, e.g. High School, College etc, have taken two forms: firstly, enrolment rate studies based on aggregate data and, secondly, cross-sectional and longitudinal studies based on individual level data. The majority come from the U.S.

Care has to be taken in interpreting the results of the U.S. studies because, in the US, young people in education quite often work part-time. This means that young people do not face a binary choice between education or work, but rather two choices as to whether to mix the two or not and which to make their major activity. The fact that work and education are often mixed complicates the analysis of the effect of job availability upon young people's

educational choices. For instance, if unemployment is high, on the one hand, this will tend to reduce the opportunity cost of education and hence encourage young people to continue in education. On the other hand, it will reduce the possibility that young people can work whilst in education and might, therefore, discourage young people from poorer families from continuing in education. Depending upon which of these tendencies predominates, the participation of young people in post-compulsory education will be either positively or negatively related to job availability measures.

Enrolment Rate Studies

Studies from the U.S. (Duncan, 1965; Conlisk, 1969; Edwards, 1975; Mattila, 1982) and studies from Australia (Gregory and Duncan, 1980; and, Merrilees, 1981) variously indicate that young peoples' post-compulsory secondary schooling enrolment rates and tertiary education enrolment rates were significantly related to family background variables, such as parents' education and family income.[9] Furthermore, young people were often found to be discouraged workers, i.e. their enrolment rates increased as all ages and youth unemployment increased. Mattila (1982) found evidence that young people's decisions as to whether to finish High School, enter college and complete college were sensitive to the internal rate of return to High School and college attendance.

The evidence from Britain (Pissarides, 1982) indicates that the proportion of 18 year olds continuing into university was a simple function of the number of young people with two A-levels, i.e. the minimum university entrance requirement, which was in turn a function of aggregate consumption expenditures (a proxy for permanent income), the earnings of graduates relative to non-graduates and the staying-on rate two years previously. Pissarides (1981) found that the staying-on rate was, in the case of males, affected by

aggregate consumption expenditures, the adult unemployment rate and the earnings of stayers relative to non-stayers, and, in the case of females, by the demand for young females' labour and relative earnings.[10]

Cross-Sectional and Longitudinal Studies Based on Individual Data

The results of U.S. Studies (Korbel, 1966; Radner and Miller, 1970; Lerman, 1972; Kohn *et al*, 1976; Willis and Rosen, 1979; Mare, 1980; Gustman and Steinmeier, 1981; Stephenson, 1982; Meyer and Wise, 1982; and Borus and Carpenter, 1984) variously indicate that young people's decisions as to whether to undertake post-compulsory educational investments were positively related to measures of family characteristics, such as parents' education, family income and father's social class, positively related to test scores, i.e. ability, positively related to measures of youth unemployment, positively related to the present value of the earnings of graduates relative to non-graduates and negatively related to young peoples' wage rates.[11]

The evidence from two Irish studies (Breen, 1984; and Raftery and Hout, 1985) indicates that young people's probabilities of undertaking post-compulsory educational investments were positively related to measures of their father's social class and their individual ability.[12]

Turning to the British evidence, in her study of the factors which influenced the probability that young people chose to continue in school at the end of their compulsory schooling, Rice (1985) fitted separate probit equations for males and females. She found that the estimated equation for females fitted the data much better than that for males.[13] In fact, there were few significant coefficients in the male equation. She found that the probability that young males and females would stay-on at school was positively related to the regional unemployment rate and positively related to coming from Greater

London. In the case of females only, their probabilities of staying-on at school were found to be positively related to family income, though negatively related to the proportion of that income received in the form of state-provided transfer payments, and also negatively related to the number of working females in their households.

Micklewright (1987), in his study of the probability that young people in England and Wales chose not to stay-on at school in 1974, found that the probability of leaving school at sixteen, i.e. choosing not to stay-on, was negatively related to father's and mother's social class, coming from an unbroken home, measures of reading and arithmetic ability at age sixteen, coming from either a grammar or private school and coming from Wales. For females only, the probability of leaving school aged sixteen was found to be positively related to the number of siblings. For males only, the probability of leaving school aged sixteen was found to be negatively related to coming from London or the south east of England. Micklewright (1987) found that family income did not play a significant role in determining individual's probabilities of leaving school at age sixteen and he attributed this result to poor income data.[14]

Summary

It appears from the evidence relating to young people's post-compulsory educational investments reviewed above that the probability that a school leaver would choose to continue in full-time tertiary education can be expected to be influenced by two types of variables: family background variables and economic variables. The family background variables should include measures of parental socio-economic characteristics, parental education and other family descriptors, e.g. number of siblings. The economic variables should include such things as: measures of young people's employment prospects and the

present value of the earnings of those individuals who undertook the educational investment and those who did not. The lack of any wage data in the SEDA, apart from that for a 20% sub-sample in 1983, precludes the consideration here of the influence of relative earnings in determining young people's probabilities of continuing into full-time tertiary education.

7.2.4. The Educational System as a Sorting Device

In his study of the determinants of the probability that young white American males would choose to continue in the educational system at various watershed points, e.g. the end of compulsory secondary schooling, the end of High School etc, Mare (1980) points out that the effect of family background characteristics upon such probabilities will progressively decline as individuals enter the upper tiers of the educational system, due to prior sorting on family background characteristics.

As one moves towards the upper tiers of the educational system, those young people who still remain within the system become progressively more homogeneous and advantaged, in terms of their family background. The reasons for this increasing homogeneity include the fact that family background characteristics influence educational attainment via measured mental ability and grades, and the fact that they also affect the selective influence of peers, teachers and parents. Furthermore, the opportunity and direct costs associated with post-compulsory education dramatically increase the importance of family socio-economic characteristics at the end of compulsory secondary education.

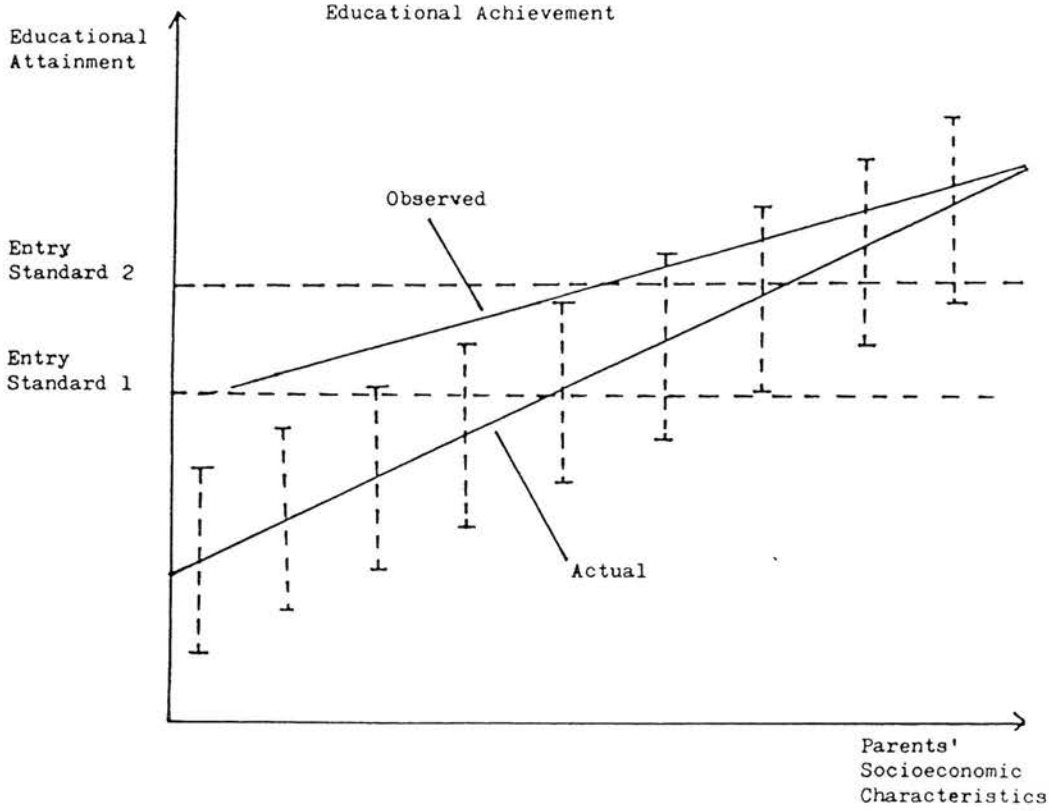
The increasing homogeneity of young people, in terms of family background characteristics, as one moves from the lower to the upper tiers of the educational system, will tend to reduce the effect of such characteristics on educational choices. Furthermore, as one moves from the lower to the upper

tiers of the educational system, the remaining students will become increasingly composed of those individuals who intend to undertake further courses of education. The consequent increasing concordance of expectations will, as a result of peer influence, weaken the effect of family background characteristics upon the decisions of those remaining students from less advantaged families.

Figure 7.3, which shows the effect of sorting upon the relationship between parental socio-economic characteristics and achieved education, helps to demonstrate this point. Assume that there are single measures of both young people's educational attainment and their parents' socio-economic characteristics. Assume also that providing certain entry standards, defined in terms of educational attainment, are met, young people can pass on to the next level of the education system should they wish to. It is further assumed that those young people whose educational attainment does not equal or exceed entry standard one are not allowed to enter the next stage in the educational system. This stage might be, for instance, the stage at which college entry qualifications can be obtained.

Suppose we are given a sample of young people who have been allowed to attempt to obtain entry standard two and we use the sample to estimate the relationship between parents' socio-economic characteristics and young people's achieved education. The line we would fit to the data, i.e. the estimated regression line, would be less steep than the true line. That is, we would under-estimate the true effects of parents' socio-economic characteristics on young people's educational attainment, their likelihood of reaching entry standard two and, hence, the probability that they would go on to college, all because of prior sorting on parents' socio-economic characteristics within the educational system. Furthermore, because there

Figure 7.3: The Distinction Between The Actual and Observed Relationship Between Parents' Socioeconomic Characteristics And Young People's Educational Achievement



Adapted from Figure 4 in Main(1987)

would be little variation in parents' socio-economic characteristics among those young people whose educational attainment exceeded entry standard one the coefficient obtained on parents' socio-economic characteristics might not be statistically significant.

Mare (1980) and Raftery and Hout (1985) found evidence to support the above argument: they found that the effect of parental socio-economic characteristics on young people's transition through the educational system did, in fact, decline as one moved from lower to upper tiers in the system.

7.2.5. Summary

The above discussion of the results of the various studies relating to the determinants of young people's employment prospects and their decisions as to whether to undertake post-compulsory education has yielded a number of variables to be taken into account in the estimation of equations relating to Scottish school leaver's probabilities of employment and of continuing into full-time tertiary education. It has also given grounds to believe that family background measures may not necessarily turn out to be as important in determining young people's decisions as to whether to continue into full-time tertiary education as one might initially assume.

It is to the specification of the models relating to the hiring of school leavers and their decisions whether to continue into full-time tertiary education that we now turn.

7.3. The Models

7.3.1. Introduction

The contents of this section consist of an exposition of models of the processes generating school leaver's probabilities of continuing into full-time

tertiary education and employment, respectively. The discussion commences with an exposition and discussion of the Willis-Rosen (1979) model of college-going behaviour and then proceeds to a discussion of Thurow's (1976) labour queue model as applied to the hiring of school leavers.

7.3.2. The Model of School Leaver's Investment in Continued Full-Time Tertiary Education

In the following exposition of the Willis-Rosen model the following convention is adopted: when referring to the Willis-Rosen model proper, reference is made to "individuals", when referring to the adaptation of the basic model to the case of school leavers, reference is explicitly made to school leavers.[15]

Willis and Rosen (1979) assume that individuals aim to maximise their lifetime wealth by undertaking that level of education which, for them, possesses the highest present value. The present value of each level of education is assumed to be determined by their talents, which determine their potential earnings at each educational level, and their family background, which determines their discount rates. Individuals are assumed to be heterogeneous with regard to talents and family background, and some of this heterogeneity is assumed to be observed and some to be unobserved. The combination of individual's heterogeneity and their selection criterion, i.e. lifetime wealth maximisation, is assumed to sort them into educational classes, i.e. into groups whose members have undertaken the same level of education. Further details concerning Willis and Rosen's (1979) college attendance model are contained in Appendix 7.2. The following exposition only includes those features of the Willis-Rosen (1979) model relevant for present purposes.

Turning to the mathematical and statistical formulation of the Willis-Rosen

(1979) model, let Yij represent the potential lifetime earnings of individual i if education level j is chosen, let Xi represent individual i's vector of observed ability, or talent, indicators and let Ti represent a vector of unobserved ability or talent indicators. The benefits of education level j to individual i can be expressed as:

(7.1) Yij = yj(Xi,Ti) j=1,....n;

Equation (7.1) shows how the benefits of a given level of education can differ between individuals due to the influence of those factors, principally ability, which alter the marginal returns to any given level of educational investment. Equation (7.1) therefore, takes into account the fact that individuals who possess the same level of education may greatly vary in their actual earnings, due to the fact that the work activities associated with different levels of education make use of different talents or combinations of talents, some of which are unobserved.

Now, let Vij represent the present value of education level j to individual i, let Zi represent a vector of observed family background characteristics and taste effects specific to individual i and let Wi represent an unobserved vector of family background and taste effects specific to person i. Then:

(7.2) Vij = gj(yj, Zi, Wi)

Equation (7.2) translates individual i's earnings stream at educational level j into present value terms and is conditioned on family background, since family background will influence individual's discount rates (see below).

Individuals' selection criterion is:

(7.3) i chooses j if Vij = Max(Vi1,....,Vin)

One can specify the joint distribution of the unobservables T and W as:

(7.4) (T,W)~F(T,W)

In applying the Willis-Rosen model to the case of school leavers, it is necessary to consider the differences between the present values of lifetime earnings streams associated with different levels of education in more detail. Let the subscript c relate to the earnings stream that school leaver i would receive if (s)he decided to continue in full-time tertiary education for any extra period s, and let the subscript l relate to the earnings stream school leaver i would receive if (s)he decided to enter the labour market. Assuming an infinite horizon[16] and a time invariant discount rate, ri, the difference between the present value of the two lifetime earnings streams can be written as:

$$\text{(7.5) } Vic - Vil = \int_s^{\infty} pic(t).yic(t).\exp(-ri).dt - \int_0^{s} pil(t).yil(t).\exp(-ri).dt - \int_s^{\infty} pil(t).yil(t).\exp(-ri).dt$$

where:

yic (t) = The earnings at time t of school leaver i if (s)he chose to continue in full-time tertiary education.

yil (t) = The earnings at time t of school leaver i if (s)he decided to enter the labour market.

pic (t) = The per period probability that school leaver i would be observed in employment at time t if (s)he chose to continue in full-time tertiary education.

pil (t) = The per period probability that school leaver i would be observed in employment at time t if (s)he chose to enter the labour market.

ri = School leaver i's discount rate.

Equation (7.5) is different from Willis and Rosen's (1979) formulation in that the income stream school leaver i would have earned if (s)he chose not to continue in full-time tertiary education has been split into two parts: the that school leaver i would have received during the time in which (s)he was in

continued full-time tertiary education (shown by the second term in (7.5)) and the income (s)he would have received thereafter (shown by the third term in (7.5)). It is also different because it explicitly includes the terms pil(t) and pic(t) take into account the fact that getting a job is not a certainty. It is assumed that the per period probability of observing school leavers who continued in full-time tertiary education to be in employment (after completing their period of continued full-time education) is higher than the per period probability of observing school leavers who did not continue in education to be in employment. This assumption is in line with the results of the studies reviewed in sub-section 7.2.2 above.

The expected income that school leaver i would have received during the time (s)he might have been in continued full-time tertiary education represents the opportunity cost (foregone earnings cost) of continued full-time tertiary education. This cost depends upon two factors: the wage that that school leaver might have been expected to have earned in a job and their per period probability of getting a job. The lower the school leaver's expected wage and probability of getting a job, the lower the opportunity cost of continued education. During periods of excess supply in the youth labour market, the probability that any given school leaver will obtain a job, in any given period, will decline. This will reduce the opportunity cost of continued full-time tertiary education because it will increase the expected proportion of the time during which a school leaver who decided not to continue in full-time tertiary education spends receiving unemployment compensation instead of a wage.[17]

So, when deciding whether to continue in full-time tertiary education, school leavers have to form expectations of the wage they might expect to earn should they enter the labour market and become employed, and, their per period probability of employment. Since the SEDA data set contains wage data

for only 20% of the 1983 respondents, the approach taken here is to include a measure of school leaver's expectations of their probabilities of employment, i.e. the fitted or imputed probabilities from an estimated probit equation, along with those ability, or talent, indicators which might be expected to influence school leaver's wage rates, in the probability of continuing into full-time tertiary education equation. This approach is, therefore, a reduced form approach.

Returning to the consideration of the Willis-Rosen model proper, it can be seen from equation (7.5) that the discount rate is assumed to differ between individuals. An individual's discount rate can be written as:

(7.6) $r_i = dZ_i + u_i$

where:

r_i = Individual i's discount rate

Z_i = Vector of observed family background and taste variables which influence the discount rate

u_i = Permanent unobserved family background and tastes component which influences individual i's discount rate

The individual's decision rule is that (s)he will decide to continue in education if $V_{ic} > V_{il}$ and will choose not to continue in education if $V_{ic} < V_{il}$. Let l_i equal $V_{ic} - V_{il}$, then this decision rule can be re-expressed in the present case as: a school leaver will decide to continue in full-time tertiary education if $l_i > 0$ and will decide not to continue in full-time education if $l_i < 0$. From the above discussion, l_i can be written as:

(7.7) $l_i = f(X_i, Z_i, P_i, T_i, W_i, u_i)$

where:

P_i = School leaver i's subjective estimate of his/her probability of employment

Linearising (7.7), yields:

(7.8) Ii = bXi + dZi + gPi + Mi

where:

Mi = Ti + Wi + ui

Equation (7.8) can be written in a more compact form as:

(7.9) Ii = BCi + Mi

where:

Ci = (Xi, Zi, Pi)
B = (b, d, g)

The probability that a school leaver decides to continue in full-time tertiary education can be expressed as:

(7.10) = Prob(Mi > -BCi) = 1-F(-BCi)

where:

F = Cumulative distribution function for Mi.

Similarly, the probability that a school leaver chooses not to continue in full-time tertiary education can be expressed as:

(7.11) Prob(Mi$\leqslant$-BCi) = F(-BCi)

These probabilities can be estimated for each school leaver by maximising the following likelihood function with respect to B:

(7.12) L = Π_IF(-BCi)Π_c[1-F(-BCi)]

The result will be a vector of parameter values which maximises the likelihood of observing the actual proportions of school leavers found to be in continued full-time tertiary education and not in continued full-time tertiary education, i.e. in the labour market. For the estimation of (7.12) an assumption

for the functional form F, i.e. the cumulative distribution function for the error term Mi, is required. It is assumed here that the cumulative distribution function is normal and this leads to the estimation of the model by the probit method. The probit method requires the added assumption that the variance of the error term of the equation is normalised to be equal to one, since only the parameters divided by the error variance are estimable, and not the parameters and error variance separately. (Maddala, 1983).

7.3.3. The Model of Employers' Hiring of School Leavers

The aim in this sub-section is to present the model of employers' hiring of school leavers. The model is Thurow's (1976) labour queue model. Since this model has been discussed in earlier Chapters the following discussion will be brief. Firms are assumed to offer jobs with training packages, i.e. training slots, to applicants. The wages attached to these training slots are assumed to be fixed. Applicants compete for such training slots on the basis of their expected training costs. Since employers differ in their views as to which personal characteristics, e.g. educational qualifications, gender, ages, etc, are important in determining training costs and in their views as to the relative importance of each characteristic, as a predictor of training costs, they will differ in the rankings they give to identical individuals in their labour queues. Furthermore, applicants will vary in their performance in application form filling, interviews, aptitude tests, etc, when applying for different jobs and this will lead even identical employers to assess a given applicant's personal characteristics differently. Moreover, some employers may be better at screening applicants than others and such employers may gather more pertinent information during the application process than less able employers. Such differences between applicant's performances when applying to different firms and differences between employers will introduce a random element into employer's

assessments of applicant's potential training costs and placement of individuals in their labour queues.

Following Main (1987), one can assume that even identical school leavers will face a distribution of assessments, by employers, of their potential training costs rather than a single valued assessment. It follows that applicants will face a distribution of places in employers' labour queues rather than just one place. Letting lj denote the negative of potential training costs, then applicant j's ranking in employers' labour queues can, assuming a linear functional form, be written as:

(7.13) $l_j = bo + g_i X_{ij} + v_j, v_j \sim N(0, \sigma_v^2), j=1, \ldots, N;$

where:

Xij = A vector of personal characteristics, i, specific to school leaver, j

bo = Constant term

gi = A vector of i unknown parameters

vj = Error term

Those school leavers nearest the front of employers' labour queues are offered first refusal on the available jobs. Depending upon firm's sales, they will cease hiring once they have reached a certain point down their labour queues. The value of lj at which employers cease hiring, l*, can be set at an arbitrary value, say $l^* < 0$, and the constant term can then be left to accommodate any error made in this assumption (Main, 1987).

The probability that any individual school leaver, j, will be found in employment can be written as:

(7.14) $Prob(y_j=1) = Prob(l_j > l^*)$
$= Prob(v_j > -ko - g_i X_{ij})$

where:

ko = Adjusted constant term referred to above

yj = 1, if j is found in employment, 0, otherwise

When applying the model to the data for school leavers, one has to take account of the fact that school leaver's probabilities of employment will vary according to the number of vacancies for which they may have been able to apply. The vector Xij should, therefore, include some measure of the pressure of demand, e.g. school leaver's local unemployment rate. It must also be recognised that school leavers can only apply for those vacancies they hear about. Those school leavers whose fathers were in employment would have been more likely to hear of vacancies through informal workplace-centred information networks and so the Xij vector should include an indicator of whether a school leaver's father was in employment.

Returning to the specification of the model, including Ko in the vector of parameters to be estimated and letting F denote the cumulative distribution function for the error term, vj, allows equation (7.14) to be rewritten as:

(7.15) Prob(yj=1) = 1 − F(−gXj)

Similarly the probability that an individual school leaver, j, will not be found in employment can be written as:

(7.16) Prob (yj=0) = F(−gXj)

The likelihood function relating to the sample of school leavers can be written as:

(7.17) $L = \Pi_{yj=0} \; F(-gXj).\Pi_{yj=1} \; (1-F(-gXj))$

Given a sample of school leavers and an assumption concerning the

functional form for F, the above likelihood function can be maximised with respect to the vector g, to find the vector of parameter values which maximises the likelihood of observing the actual proportions of school leavers observed to be in, or out of, employment. It is assumed here that F is normal and this leads to the estimation of a probit model.

7.4. Data, Estimation Issues and Variables

7.4.1. The Data

The data to be used in estimation was taken from the 1979, 1981 and 1983 SEDA data sets. A number of restrictions were placed upon the data used in estimation. The first restriction was that only those school leavers who reported that they were in full-time tertiary education, employment, unemployed, or, on government schemes for the young unemployed were included. That is, those school leavers who reported that they were in the "other" category, i.e in part-time employment, unemployed but undertaking part-time education, etc, were excluded. The reasons for this restriction were, firstly, that it is difficult to tell what many of these school leavers were actually doing and, secondly, there were too few of them to make a model of the three way split between employment, non-employment and "doing something else" worthwhile.

The second restriction was that only school leavers who left at the end of their fourth, fifth or sixth form were included. A very small number of school leavers left at the end of their third form. They appear to have been a rather idiosyncratic group, most of whom were recorded as being unemployed. Yet again, the small numbers involved (such school leavers usually account for less than 2% of all leavers (SED, 1986)) did not justify complicating the analysis by their inclusion.

The third restriction was that only those school leavers who gave full responses, i.e. had a value recorded for all the variables to be used in both the probit equations, were included. This restriction simply resulted from the fact that the estimation of the probit equations requires values for all of the variables included in both of them because the fitted values from the probability of employment equation are included as an explanatory variable in the probability of continued full-time tertiary education equation.

Before the 1979 SEDA data set could be used, it was necessary to counter the effects of the double sampling of non-certificated school leavers and those school leavers who only achieved O grade fails. Accordingly, only a randomly chosen 50 percent sub-sample of such school leavers was included in the 1979 data set used for estimation.

After applying the three restrictions discussed above, and only including 50 percent of the non-certificated and those with O grade fails, there were 5650 full cases in the 1979 data set. These 5650 cases represented approximately 6.1 percent of the 91,100 young people who left school at the end of the 1977/78 academic session. For the sake of consistency, the same sampling fraction was applied to eligible school leavers from the 1981 and 1983 Scottish School Leavers Surveys, leaving 5559 and 5371 from the 1981 and 1983 SEDA data sets, respectively. Altogether, 16,580 school leavers were included in the combined, i.e. combined 1979, 1981 and 1983, data set used for estimation purposes.

Finally, the data relating to school leaver's post-school destinations relates to the Spring of the survey years and therefore relates to a period some ten months after summer school leavers, i.e. the majority of school leavers, had left school and sixteen months after Christmas leavers had left school.

7.4.2. The Model Fitting Procedure

The aim in this sub-section is to discuss how one can use a maximum likelihood model fitting procedure to decide whether to stratify the sample prior to estimation in order to take into account the differences according to gender, survey year and stage of school leaving, in the proportions of school leavers continuing into full-time tertiary education, and the proportion entering employment, discussed in sub-section 7.1.3.

The model fitting procedure makes use of a likelihood-ratio test statistic. In order to compute the likelihood-ratio test statistic one estimates two equations. The first constrains all the parameters, including the constant, to be the same for each comparison group. The second allows the parameters to differ between each comparison group. Twice the difference between the log likelihood statistic for the restricted and unrestricted equations is asymptotically distributed as chi-squared with as many degrees of freedom as there are parameters in the constrained equation (including the constant). Further details of the model fitting procedure are contained in Appendix 7.3.

The rationale underlying this statistic is that if the process of interest does differ significantly between the comparison groups then the difference in the fit of the two equations, as indicated by their log likelihood statistics, will be large because the constrained equation is mis-specified. On the other hand, if the process of interest does not differ significantly between the comparison groups, the difference between the fit of the two equations will be quite small.

This method of testing for differences in the process of interest between comparison groups has the practical disadvantage that there may be many parameters to be estimated in the unconstrained equation and this means that the number of explanatory variables included in the two estimating equations

needs to be limited to a relatively low number.

7.4.3. Variables

To start with the probability of employment equation, the three variables to be included are: a measure of school leaver's ability, a dummy variable indicating whether a school leaver's father was in employment and the all ages' (both genders combined) unemployment rate in school leaver's travel-to-work areas. Moreover, school leaver's gender, when they left school, i.e. early or late, and, the survey in which they were included, are implicitly taken into account when performing the model fitting procedure. Definitions of the stratifying variables are given in Table 7.4 and definitions of the variables included in the probability of employment equations are given in Table 7.5.

The variables relating to school leaver's ability, gender and when they left school (which may be regarded as a proxy for age in the present context) were included because they are likely to be used by employers in predicting school leaver's training costs and, hence, in allocating places in their labour queues. The variable relating to whether a school leaver's father was in employment or not was included to take into account any disadvantage suffered by school leavers with an unemployed father as a result of their reduced contact with informal labour market information networks. Finally, the variables indicating in which survey school leavers were included and the local unemployment rate were included to account for temporal and cross-sectional variations in the pressure of demand in the labour market.

The eight variables to be included in the probability of full-time education estimating equations are: a dummy variable indicating whether school leavers came from a large family, a measure of school leaver's ability, a dummy variable indicating whether one or both of a school leaver's parents remained

Table 7.4 Stratifying Variables

1. When the respondent left school

   A dummy variable equal to one if a school leaver left school after Christmas of the fifth form.

   Zero otherwise.

2. Gender

   A dummy variable equal to one for female school leavers. Zero for male school leavers.

3. Which survey:

   (i) A dummy variable equal to one for those school leavers included in the 1981 survey.

   Zero otherwise.

   (ii) A dummy variable equal to one for those school leavers included in the 1983 survey.

   Zero otherwise.

   (iii) The school leavers in the 1979 survey comprised the omitted category.

Table 7.5 Variables in the Probability of Employment Equations

Dependent Variable:

A dummy variable equal to one for those school leavers in employment in the spring of the year after leaving school.
Zero otherwise.

Independent Variables:

1. School Leaver's Ability:

   A logistic transformation of a scale relating to school leaver's highest educational attainment.

2. Father in Employment:

   A dummy variable equal to one if a school leaver's father was in employment.
   Zero otherwise.

3. The Local Unemployment Rate:

   The total (male and female, all ages) unemployment rate in school leavers' "travel to work area", as defined by the Manpower Services Commission, who provided the data. There were 60 travel to work areas in Scotland during the period of estimation. The data relates to April 1979, May 1981 and April 1983. These dates were chosen to be consistent with the month during which most of the questionnaires, sent to school leavers, were completed and returned.

in the education system beyond sixteen years of age, three dummy variables indicating school leaver's father's occupation, a variable indicating whether a school leaver's father was in employment and, finally, school leaver's estimated probability of employment, for those school leavers that entered the labour market, or, their imputed probability of employment, if they continued in full-time tertiary education. Definitions of the variables are given in Table 7.6.

The variables relating to whether school leavers came from a large family, whether their father was in employment, whether either of their parents had continued in education beyond the age of sixteen and the variables indicating father's occupation were included for three reasons, firstly, in order to take account of the fact that income-constrained families might be less able to support their offspring in full-time tertiary education, e.g. be able to afford the parental contributions toward student grants, secondly, to take account of the fact that certain families might have a "taste" for education, and, finally, to take account of the fact that tastes, aspirations and financial resources might be expected to vary with father's occupation and, hence, social class. The ability variable was included because, firstly, access to continued full-time tertiary education is often conditioned on a given level of ability and, secondly, to take account, in a reduced form manner, of the fact that school leaver's wages might be expected to vary with ability (See Main, 1987; for evidence to support this contention). Finally, a measure of school leaver's probability of employment was included to take into account variations between school leavers in the opportunity cost of continued full-time tertiary education.[18]

Most of the above variables are self-evident, but the measure of school leaver's ability requires some additional explanation. The measure is a logit re-scaling of a fourteen point scale of school leaver's Scottish Certificate of Education (SCE) attainment proposed in Willms (1986). The original fourteen

Table 7.6 Variables in the Probability of Continued Full-Time Education Equations

Dependent Variable

A dummy variable equal to one for those school leavers who were in full-time tertiary education in the spring of the year after leaving school. Zero otherwise.

Independent Variables

1. Large family

   A dummy variable equal to one if a school leaver had four or more brothers or sisters.

   Zero otherwise.

2. School Leaver's Ability:

   A logistic transformation of a scale relating to the highest educational attainment of school leavers.

3. Parents' Education:

   A dummy variable equal to one if either of a school leaver's parents had left school aged 17 years old or more.

   Zero otherwise.

4. Father's Social Class:

   (i) A dummy variable equal to one if a school leaver's father was in a professional or intermediate occupation.

   (ii) A dummy variable equal to one if a school leaver's father was in a skilled occupation.

   (iii) A dummy variable equal to one if a school leaver did not provide information relating to father's social class. Zero otherwise.

   (iv) Omitted category: those school leavers whose father was in a semi-skilled or unskilled occupation.

5. School Leaver's Estimated Probability of Employment:

   The fitted value (for those school leavers who did not continue in full-time education) or imputed value (for those school leavers who did continue in full-time education) from the relevant estimated probability or employment equation.

point scale (see Appendix 6.1) recorded school leaver's lack of qualifications, or, their total number of O Grade passes (for those school leavers who possessed only O Grades) and recorded only their total number of Higher passes (for those school leavers who possessed Highers). The main practical disadvantage of using this scale to provide dummy variables for estimation is that the scale is ordinal in nature, and the differences between any two dummy variables is arbitrary and different definitions of the dummy variables will produce different results.

The assumption underlying the logit re-scaling is that ability is logistically distributed across the population of school leavers and that differences in ability (input) directly cause measured differences in SCE attainment (output).[19] One can therefore work back from SCE attainment (output) to ability (input). The scaling was undertaken separately for those school leavers in the 1979, 1981 and 1983 surveys, using all of the replies included in the 1979 and 1983 SEDA data sets and only half of the 1981 SEDA data set, since this data set was so large. The formula used to perform the scaling was:

(7.18) $Y = [G(P) - G(p)]/[P-p]$

where:

$Y =$ scaled logistic ability score

$G(p) =$ $p.1n(p) + (1-p).1n(1-p)$

$p =$ the fraction of school leavers scoring beyond the given grade

$P =$ the fraction of school leavers scoring beyond and including the given grade

The mean of the scale values, across the population of school leavers in each survey year, was zero and the standard deviation approximately equal to 1.7. The scale values were then standardised by dividing them by the appropriate standard deviation. The scale values used in estimation, therefore,

had a mean of zero and a standard deviation equal to one. The actual scale values are shown in Table 7.7.

The logistic scaling has two main advantages in the present context. Firstly, it relates to ability - the main factor which is assumed to influence the marginal rate of return to a given level of educational investment (see sub-section 7.3.2 above). Secondly, the scaling converts an ordinal variable to a continuous variable and, therefore, makes it more convenient for estimation purposes.

7.5. Estimation Results

7.5.1. Introduction

This section contains a discussion of the results obtained from estimating the probability of employment equations and the probability of continued full-time tertiary education equations. Sub-section 7.5.2 contains the discussion of the results obtained from estimating the probability of employment equations. Sub-section 7.5.3 contains the discussion of the probability of continued full-time tertiary education equations. Sub-section 7.5.4 contains the results of a set of calculations relating to two stylised groups of school leavers' probabilities of being observed in employment, non-employment or in continued full-time tertiary education in 1979, 1981 and 1983.

7.5.2. The Probability of Employment Equations

Starting with the model fitting procedure, Table 7.8 shows the results of the likelihood ratio tests performed upon the employment equation. The results contained in Table 7.8 indicate that the process generating school leaver's probabilities of employment differed significantly according to when they left school, and, according to the survey in which they were included. However, the tests indicate that there was no significant difference between the genders.

Table 7.7: The Scaled Logistic Ability Score in 1979, 1981 and 1983

SCE Attainment Level	1979 Scaled Ability Score	1981 Scaled Ability Score	1983 Scaled Ability Score
1. 6 or more Highers	2.564	2.623	2.469
2. 5 Highers	1.643	1.631	1.501
3. 4 Highers	1.245	1.201	1.080
4. 3 Highers	1.009	0.969	0.850
5. 2 Highers	0.834	0.785	0.678
6. 1 Higher	0.679	0.620	0.514
7. 6 or more O-Grades (A-C) but No Highers	0.536	0.477	0.375
8. 5 O-Grades (A-C)	0.419	0.367	0.280
9. 4 O-Grades (A-C)	0.313	0.272	0.189
10. 3 O-Grades (A-C)	0.195	0.163	0.077
11. 2 O-Grades (A-C)	0.054	0.032	-0.059
12. 1 O-Grade (A-C)	-0.129	-0.142	-0.247
13. O-Grade Fails Only	-0.416	-0.356	-0.480
14. No SCE Awards	-1.285	-1.178	-1.282

Table 7.8: Results of Hypothesis Tests on The Probability of Employment Equation

Hypothesis	Test Statistic -2(LR-LU)	Result
1. That the process was the same for both genders	8.8	Fail to reject hypothesis at 5% level
2. That the process was the same in 1979 and 1981	40.1	Reject hypothesis at 1% level
3. That the process was the same in 1979 and 1983	73.8	Reject hypothesis at 1% level
4. That the process was the same in 1981 and 1983	24.7	Reject hypothesis at 1% level
5. That the process was the same for those who left school at or before Christmas of the fifth form and for those who left later than Christmas of the fifth form	13.3	Reject hypothesis at 5% level

Note: (1) LR = Log likelihood value from restricted equation.
(2) LU = Log likelihood value from unrestricted equation.
(3) The test statistic is distributed as χ^2 with as many degrees of freedom as there are restrictions (4)
$\chi^2_{0.05} = 9.49$ $\chi^2_{0.01} = 13.28$

It is not too surprising that the process differed between surveys since the proportion of school leavers in employment dramatically declined between 1979 and 1981, and again between 1981 and 1983. Moreover, it is not too surprising that the process differed according to when school leavers left school, since those who left after Christmas of the fifth form, i.e. late leavers, were better qualified, and older than their counterparts who left before Christmas of the fifth form, i.e. early leavers; and age and ability are important hiring criteria. Finally, the fact that the process did not differ between the genders is consistent with the results of the analysis of school leavers' industrial pattern of net employment change (see Chapter Two) which showed that the proportionate decline in school leavers' employment did not differ greatly between the genders over the period 1979–83.

The estimated employment equations are reported in Table 7.9. Table 7.10 contains the mean and standard errors of the variables used in estimation. It can be seen from Table 7.9 that the chi-squared statistics relating to the significance of the estimated equations, show that five out of the six equations were significant at the 1% level. The lone exception was the equation relating to late school leavers drawn from the 1979 survey. The McFadden r-squared statistics shown in Table 7.9 are provided as means of comparing the fit of the estimated equations,[20] and are generally low in value. They suggest that the estimated equations do not account for a great deal of the observed differences in school leaver's employment outcomes. Furthermore the equations tended to have a better fit for early school leavers than late school leavers. This may reflect differences, between early and late school leavers in the relative importance of omitted variables, such as the effects of minimum age laws, "mature attitudes", appearance, etc. The equation relating to late school leavers from the 1979 survey had a particularly poor fit.[21]

Table 7.9: The Estimated Probability of Employment Equations

Group	(1)	(2)	(3)	(4)	(5)	(6)
Survey	1979	1979	1981	1981	1983	1983
When Left School[A]	Early	Late	Early	Late	Early	Late
Independent Variables:						
Logistic Ability Score	0.379**[B]	-0.021	0.566**	0.494**	0.506**	0.318**
	(9.18)	(0.17)	(11.47)	(9.74)	(11.23)	(4.87)
Father in Employment	0.216**	0.172	0.246**	0.394**	0.425**	0.316**
	(3.14)	(0.88)	(5.37)	(5.27)	(7.39)	(3.31)
Local Unemployment Rate	-0.075**	-0.017	-0.082**	-0.052**	-0.069**	-0.038**
	(6.95)	(0.67)	(9.94)	(5.96)	(10.13)	(3.94)
Constant	1.575	1.515	1.488	0.974	1.133	0.567
McFadden R^2	0.05	0.00	0.11	0.09	0.10	0.04
$X^2(3)$	169.0**	1.2	312.5**	208.5**	352.5**	62.8**
Mean of Dependent Variable	0.807	0.935	0.616	0.757	0.493	0.680
N	3365	1067	2112	2021	2548	1277

Notes: (A) "Early" leavers left school at or before Christmas of the fifth form and "late" leavers left school after Christmas of the fifth form.

(B) ** indicates significance at the 1% level for the t-statistics relating to the independent variables individually and for the chi-squared statistics relating to the equations as a whole.
* indicates significance at the 5% level for the t-statistics relating to the independent variables individually and the chi-squared statistics relating to the equations as a whole.

Table 7.10: The Means and Standard Errors of The Variables Used in The Probability of Employment Equations

Group	(1)	(2)	(3)	(4)	(5)	(7)	
Survey	1979	1979	1981	1981	1983	1983	Whole
When Left School^	Early	Late	Early	Late	Early	Late	Sample
Variables:							
Employment	0.81	0.94	0.62	0.76	0.49	0.68	0.70
	(0.007)	(0.008)	(0.011)	(0.010)	(0.010)	(0.013)	(0.004)
Logistic Ability Score	-0.60	0.76	-0.56	0.27	-0.75	0.46	-0.26
	(0.011)	(0.015)	(0.013)	(0.014)	(0.012)	(0.016)	(0.007)
Father in Employment	0.86	0.91	0.72	0.79	0.69	0.83	0.79
	(0.006)	(0.009)	(0.010)	(0.009)	(0.009)	(0.011)	(0.004)
Local Unemployment Rate	8.23	7.97	13.22	12.72	15.35	15.51	12.00
	(0.040)	(0.071)	(0.080)	(0.084)	(0.078)	(0.111)	(0.041)
N	3365	1067	2112	2021	2548	1277	12390

Notes: (A) = see note (A) to Table 7.9

One possible explanation for the poor performance of the equation relating to late school leavers in 1979 is that, unlike any other group of school leavers in any of the surveys, the market for their labour may have been either in equilibrium, or, in a situation of excess demand, i.e. their employment may have been supply constrained. This explanation is suggested by the high proportion (94%) found in employment. Six per cent non-employment is not inconsistent with full employment in a youth labour market, since some school leavers may have been voluntarily unemployed and because young people were once renowned for their high rates of job turnover (Roberts, 1984).

If late school leavers in 1979 were experiencing full employment or excess demand for their labour, then the estimated employment equation would be attempting to distinguish between those in employment and those either frictionally or voluntarily non-employed. Since the estimating equation was formulated upon the assumption that school leavers' employment was demand-determined and that, therefore, the division of school leavers into those who were employed and those who were not was determined by employers' hiring decisions, the estimating equation might not be expected to perform well. In fact, the equation could only be expected to perform adequately if the included explanatory variables were capable of explaining school leavers' frictional and voluntary non-employment. The results contained in Table 7.9 suggest that they can not.

Turning to the performance of individual variables, it appears from Table 7.9 that in all the equations, apart from the one relating to late school leavers in 1979, the scaled logistic ability score variable performed as expected; that is, it was both positive and highly significant. This result suggests that ability, as indicated by educational qualifications, was an important hiring criterion. As anticipated, having an employed father significantly increased school leaver's

chances of gaining employment. This result is taken to reflect the advantages of having access to informal labour market networks (Rees, 1966; Jenkins *et al*, 1983), and motivational factors. Finally, as anticipated, school leaver's chances of gaining employment were found to be both significantly and negatively related to their local unemployment rate.

Figures 7.4 and 7.5 show some of the information contained in Table 7.9 in a different way. Figure 7.4 shows the counter-factual relationship between two "typical" school leaver's probabilities of employment and their scaled logistic ability scores in 1979, 1981 and 1983, and was constructed in the following way. The fitted equations for early and late school leavers were used to provide the "baseline" probabilities of employment for the "typical" early and late school leavers who were defined to have a father in employment and come from an area with the average, 1979, local rate of unemployment. These characteristics were then combined with the 1979 coefficients to produce "baseline" probabilities which were augmented by allowing for the effects of differences between the estimated coefficients on the logistic ability score and the different ranges of the logistic ability score in 1979, 1981 and 1983. The estimated probabilities shown in Figure 7.4 are, therefore, *ceteris paribus*, or counter-factual, estimates since they only allow for the effect of changes in the coefficient on, and the value and range of, the logistic ability score.

The group of three lines towards the top of Figure 7.4 relate to the late school leaver and the three lines further down relate to the early school leaver. The downward sloping line at the top of the figure relates to the late school leaver in 1979. It can be seen from the figure that the relationship between the two typical school leaver's probabilities of employment and their scaled logistic ability score appears to have become stronger after 1979. This may reflect the deterioration in the market for school leavers' labour after 1979 and employers'

Figure 7.4 The relationship between the probability of employment and the scaled logistic ability score.

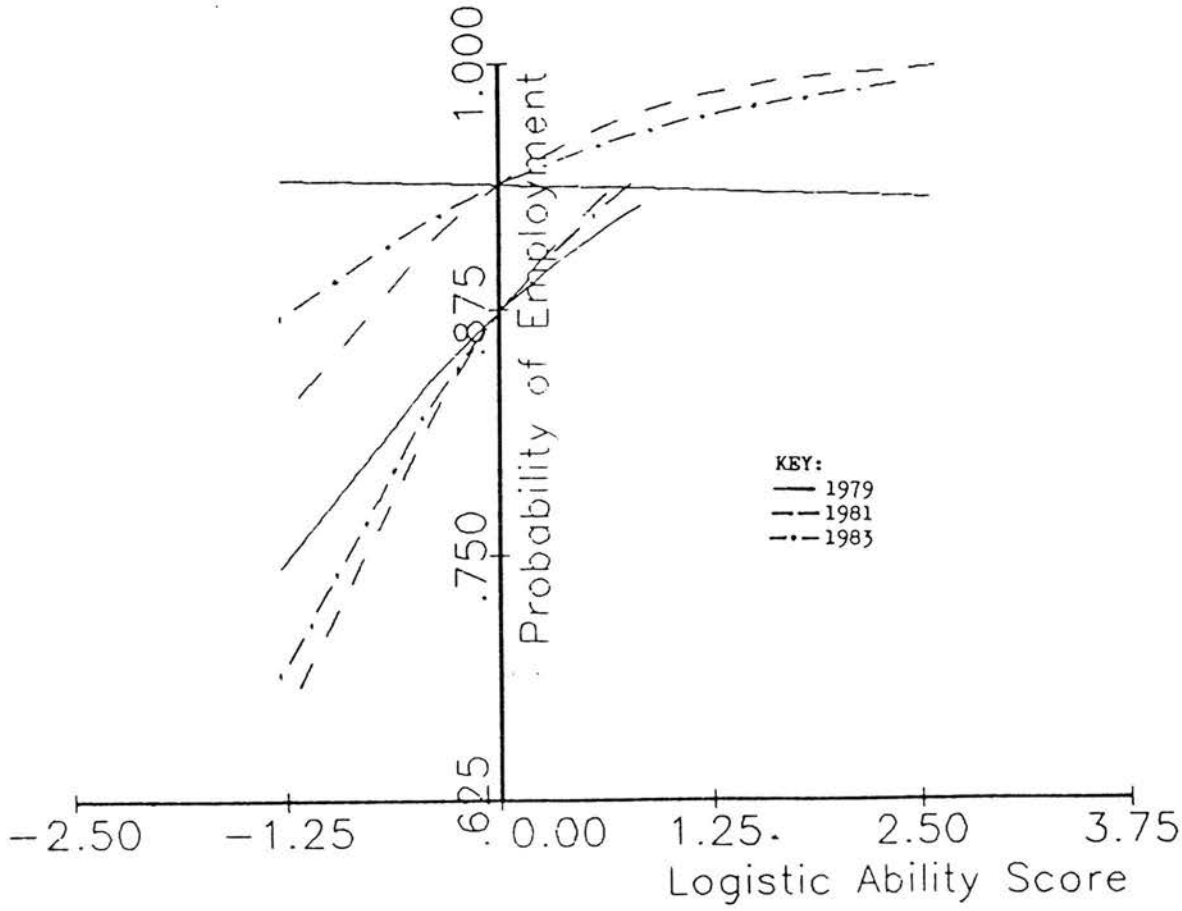
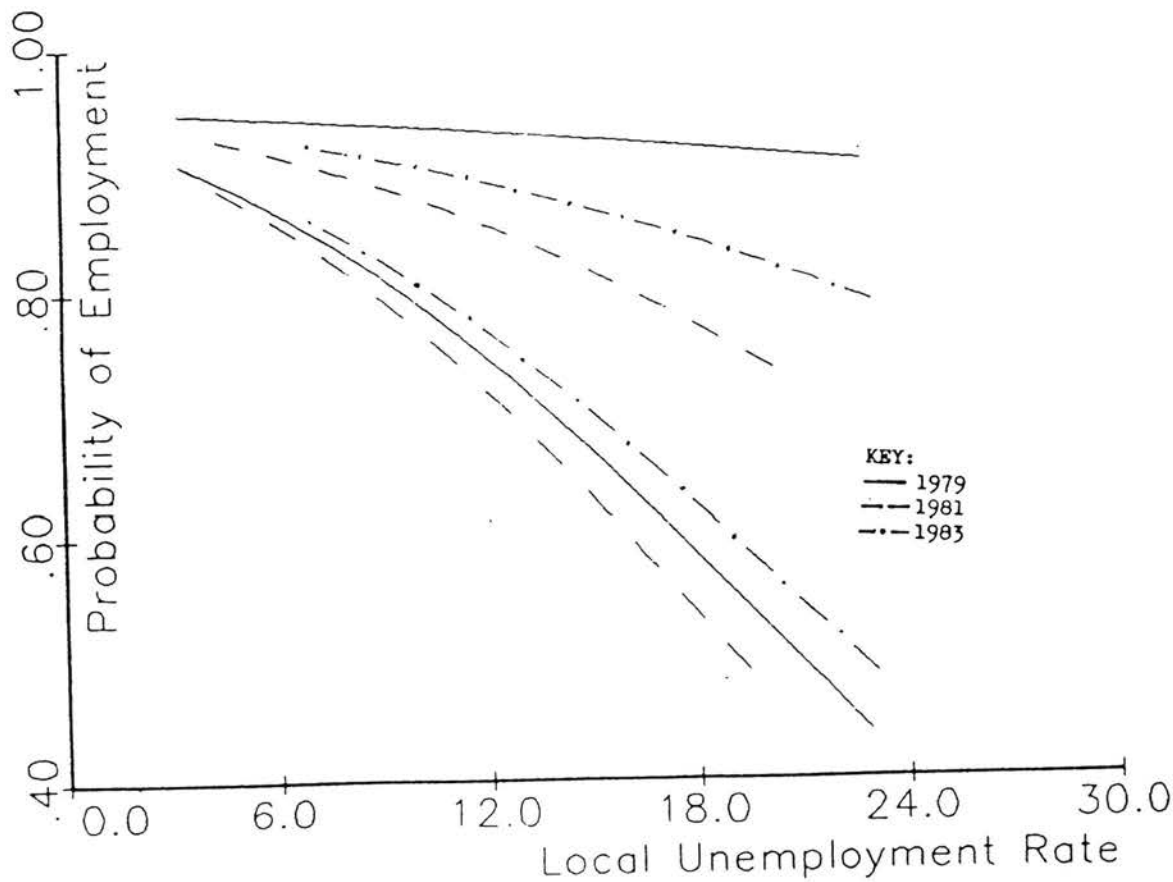


Figure 7.5 The relationship between the probability of employment and the local unemployment rate



more stringent use of educational qualifications, i.e. ability, as a hiring criterion.

Figure 7.5 shows the counter-factual relationship between two "typical" early and late school leaver's probabilities of employment and the local unemployment rate. The typical school leavers are defined as having a father in employment and the average 1979 value of the logistic ability score for early and late school leavers, respectively. The group of three lines towards the top of Figure 7.5 relate to the late school leaver and the group of three lines further down in the figure relate to the early school leaver. It can be seen from the figure that, after 1979, the typical late school leaver's probabilities of employment became more sensitive to the local unemployment rate, which reflects the excess supply of late school leavers' labour after 1979. The relationship between the typical early school leaver's probability of employment and the local unemployment rate seems to have been fairly constant between 1979 and 1983, and the relationship was stronger than that for the typical late leaver.

A particularly effective way of demonstrating how school leavers fared in the labour market in 1979, 1981 and 1983 is to compare the expected probability of employment of two stylised groups of school leavers who are labelled "advantaged" and "disadvantaged", respectively.[22] The characteristics attributed to advantaged and disadvantaged school leavers are described in the footnotes to Table 7.11a and detailed in Table 7.11b. The expected probabilities of employment shown in Table 7.11a for advantaged and disadvantaged school leavers were calculated by inserting the values of the relevant characteristics into the appropriate equations in Table 7.9 and computing the resulting expected probabilities.

It can be seen from Table 7.11a that, apart from late school leavers in 1979,

Table 7.11a: The Expected Probabilty of Being in Employment for Two Stylised Groups of School Leavers

Group	(1)	(2)	(3)	(4)	(5)	(6)
Survey	1979	1979	1981	1981	1983	1983
When Left School[A]	Early	Late	Early	Late	Early	Late
(1) "Advantaged"[1]	0.927	0.943	0.880	0.917	0.776	0.819
(2) "Disadvantaged"[2 3]	0.572	0.903	0.308	0.481	0.189	0.463
(3) Difference	0.355	0.004	0.572	0.436	0.587	0.356

Notes: (A) See note (A) Table 7.9.

(1) "Advantaged" school leavers are defined as school leavers whose father was in employment, whose scaled logistic ability score was one standard deviation above the mean for their group and, finally, whose local unemployment rate was one standard deviation below the overall, average unemployment rate.

(2) "Disadvantaged" school leavers are defined as those school leavers whose father was not in employment, whose scaled logistic ability score was one standard deviation below the mean for their group and, finally, whose local unemployment rate was one standard deviation above the overall, average unemployment rate.

(3) See Table 7.11b for the actual values of the independent variables used in calculating the expected probabilities for the two stylised groups of school leavers.

Table 7.11b The Profiles of Advantaged and Disadvantaged School Leavers as Used In Calculating The Contents of Table 7.11a

Group	(1)		(2)		(3)		(4)		(5)		(6)	
Survey	1979		1979		1981		1981		1983		1983	
When Left School^	Early		Late		Early		Late		Early		Late	
Variables:	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan
Logistic Ability Score	0.04	-1.24	1.25	0.27	0.04	-1.15	0.90	-0.36	-0.14	-1.36	1.04	-0.11
Father in Employment	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
Local Unemployment Rate	4.7	12.3	4.7	12.3	8.3	16.3	8.3	16.3	10.5	19.1	10.5	19.1

there existed sizeable differences between the expected probabilities of advantaged and disadvantaged school leavers gaining employment. Furthermore, these differences were larger in 1981 and 1983 than in 1979, indicating that the relative disadvantage experienced by disadvantaged school leavers vis a vis advantaged school leavers increased as a result of the decline in school leavers' employment after 1979. Finally, it can be seen from Table 7.11a that the gap between the expected employment probabilities for advantaged and disadvantaged school leavers was larger for early school leavers than for late school leavers. This may indicate that the disadvantage experienced by disadvantaged school leavers vis a vis advantaged school leavers declines with age.

7.5.3. The Probability of Continuing in Full-Time Tertiary Education Equations

To start with the model fitting procedure, Table 7.12 contains the results of the likelihood ratio tests relating to the probability of continuing into full-time tertiary education equation. The results in that table indicate that the process generating school leaver's probabilities of continuing into full-time tertiary education differed significantly according to whether school leavers left school before or after Christmas of the fifth form, according to which survey they were drawn from and between the genders.

Young females are known from other sources (DES, 1985) to have a higher propensity to continue into full-time tertiary education than males. This may reflect the fact that females have less access to human capital formation opportunities in the labour market, e.g. apprenticeships, than males. The deterioration in the market for school leavers' labour between 1979 and 1981, and again between 1981 and 1983, partly accounts for the differences between the process for school leavers drawn from the three surveys. Another factor may have been the increased competition for places in higher education during

Table 7.12: Results of Hypothesis Tests on The Probability of Continued Full-Time Education Equations

Hypothesis	Test Statistic -2(LR-LU)	Result
1. That the process was the same for both genders	294.6	Reject hypothesis at 1% level
2. That the process was the same in 1979 and 1981	18.4	Reject hypothesis at 5% level
3. That the process was the same in 1979 and 1983	39.4	Reject hypothesis at 1% level
4. That the process was the same in 1981 and 1983	48.4	Reject hypothesis at 1% level
5. That the process was the same for those who left school at or before Christmas of the fifth form and for those who left later than Christmas of the fifth form	88.4	Reject hypothesis at 1% level

Note: (1) LR = Log likelihood value from restricted equation
(2) LU = Log likelihood value from unrestricted equation
(3) The test statistic is distributed as χ^2 with as many degrees of freedom as there are restrictions (9)
(5% = 16.92, 1% = 21.70)

this period, which may have raised entry standards. Finally, the differences according to when young people left school is not at all surprising since late school leavers had already demonstrated a commitment to post-compulsory education and they were better qualified than early leavers and, therefore, more able to secure a place in full-time tertiary education.

Table 7.13 contains the estimated probability of continuing in full-time tertiary education equations and Table 7.14 shows the means and standard errors of the dependent and independent variables. The chi-squared statistics in Table 7.13 indicate that all of the equations are significant at at least the 5% level. The McFadden r-squared statistics indicate that the estimating equation fits the data for late school leavers better than for early school leavers and that the estimating equation performs particularly badly in the case of early, male school leavers.

The poor fit for early, male school leavers may be due to the fact that this group has the greatest access to apprenticeships, i.e. work-based human capital accumulation, and that some members of this group faced a three-way choice at the end of their compulsory secondary schooling: continued full-time education either at school or in tertiary education, i.e. human capital accumulation in the education system; an apprenticeship, i.e. human capital accumulation in the labour market; or, the search for other non-apprenticed jobs. Other school leavers, such as females and older males, would not have had the same access to apprenticeships, because entry to apprenticeships is usually age and gender restricted. Furthermore, not all early male school leavers would have had the same access to apprenticeships, since having family links with the employer, e.g. a father working with the employer providing the apprenticeship, is known to provide advantages in the competition for apprenticeships.[23]

Table 7.13 The Estimated Probability of Continued Full-Time Education Equations

Group	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Survey	1979	1979	1979	1979	1981	1981	1981	1981	1983	1983	1983	1983
When Left School[A]	Early	Early	Late	Late	Early	Early	Late	Late	Early	Early	Late	Late
Gender	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males
Independent Variables:												
Large Family	-0.153[B]	-0.293	-0.002	-0.322*	-0.032	-0.024	-0.042	0.046	-0.103	-0.336	0.032	-0.167
	(1.55)	(1.57)	(0.01)	(2.10)	(0.23)	(0.11)	(0.44)	(0.37)	(0.77)	(1.37)	(0.29)	(1.28)
Logistic Ability Score	0.773**	0.503**	1.160**	1.236**	0.615**	0.366	1.136**	1.500**	0.569**	0.345*	0.979**	1.131**
	(6.81)	(3.01)	(12.59)	(13.33)	(3.97)	(1.64)	(12.08)	(12.74)	(4.64)	(2.12)	(9.28)	(9.51)
Parents' Education	0.480**	0.096	0.268**	0.304**	0.295	0.117	0.321**	0.061	0.528**	0.589**	0.319**	0.165
	(2.84)	(0.41)	(2.60)	(2.75)	(1.14)	(0.33)	(3.56)	(0.56)	(2.76)	(3.01)	(3.26)	(1.59)
Father in Professional or Intermediate Occup'n	0.280*	0.293	0.507**	0.376*	0.262	-0.193	0.132	0.574**	0.510**	0.528*	0.283*	-0.011
	(2.01)	(1.45)	(3.36)	(2.08)	(1.35)	(0.69)	(1.19)	(3.83)	(3.24)	(1.89)	(2.11)	(0.07)
Father in Skilled Occupation	-0.008	-0.319*	0.119	0.113	-0.071	-0.361*	-0.086	0.303*	0.015	0.396	0.117	-0.137
	(0.07)	(1.75)	(0.81)	(0.63)	(0.51)	(1.69)	(0.83)	(2.09)	(0.13)	(1.63)	(0.93)	(0.93)
Father's Occupation Not Given	0.329*	0.001	0.307	0.463	0.165	0.041	-0.076	0.693**	0.130	0.812**	0.126	-0.052
	(1.68)	(0.00)	(0.90)	(1.49)	(0.92)	(0.16)	(0.52)	(3.63)	(0.85)	(3.00)	(0.79)	(0.28)
Estimated Probability of Employment	-1.791*	-2.049*	-24.54**	-10.661	0.194	0.454	-2.054**	-1.158	0.355	0.510	-0.285	1.163
	(2.05)	(1.72)	(2.76)	(1.14)	(0.34)	(0.52)	(3.37)	(1.39)	(0.76)	(0.79)	(0.37)	(1.38)
Father in Employment	0.342	0.236	0.510	0.435	0.086	0.207	0.265*	0.343*	-0.038	0.002	-0.240*	-0.149
	(1.59)	(0.62)	(1.24)	(1.09)	(0.51)	(0.75)	(2.17)	(2.03)	(0.26)	(0.01)	(1.71)	(0.94)
Constant	0.157	-0.186	20.82	7.797	-1.247	-2.169	0.350	-1.235	-0.974	-2.348	-0.601	-1.605
McFadden R^2	0.10	0.08	0.25	0.29	0.09	0.06	0.22	0.41	0.10	0.10	0.19	0.26
$X^2(8)$	122.5**	30.4**	372.4**	389.0**	63.5**	15.6*	539.6	820.3**	110.9**	47.7**	355.7**	443.3**
Mean Dependent Variable	0.108	0.023	0.472	0.486	0.106	0.022	0.399	0.377	0.152	0.037	0.511	0.495
N	1833	1771	1094	952	1075	1177	1795	1512	1286	1514	1340	1231

Notes: (A) See note (A) to Table 7.9
(B) See note (B) to Table 7.9

Table 7.14 The Means and Standard Errors of The Variables Used in The Probability of Continued Full-Time Education Equations

Group:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Survey	1979	1979	1979	1979	1981	1981	1981	1981	1983	1983	1983	1983
When Left School^	Early	Early	Late	Late	Early	Early	Late	Late	Early	Early	Late	Late
Gender	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males
Variables:												
In Full Time Education	0.11	0.02	0.47	0.49	0.11	0.02	0.40	0.38	0.15	0.04	0.51	0.50
	(0.007)	(0.004)	(0.015)	(0.016)	(0.009)	(0.004)	(0.012)	(0.012)	(0.010)	(0.005)	(0.014)	(0.014)
Large Family	0.31	0.28	0.14	0.12	0.28	0.25	0.16	0.15	0.19	0.16	0.13	0.12
	(0.011)	(0.011)	(0.010)	(0.010)	(0.014)	(0.013)	(0.009)	(0.009)	(0.011)	(0.009)	(0.009)	(0.009)
Logistic Ability Score	-0.55	-0.59	1.06	1.17	-0.52	-0.54	0.65	0.67	-0.70	-0.73	0.83	0.83
	(0.015)	(0.016)	(0.020)	(0.023)	(0.019)	(0.018)	(0.020)	(0.023)	(0.016)	(0.015)	(0.020)	(0.021)
Parents' Education	0.04	0.06	0.31	0.29	0.04	0.04	0.21	0.19	0.04	0.06	0.25	0.23
	(0.005)	(0.006)	(0.014)	(0.015)	(0.006)	(0.006)	(0.010)	(0.010)	(0.005)	(0.006)	(0.012)	(0.012)
Father in Professional or Intermediate Occupn	0.12	0.12	0.41	0.45	0.08	0.12	0.34	0.35	0.10	0.11	0.35	0.39
	(0.008)	(0.008)	(0.015)	(0.016)	(0.008)	(0.009)	(0.011)	(0.012)	(0.008)	(0.008)	(0.013)	(0.014)
Father in Skilled Occupation	0.45	0.46	0.37	0.36	0.46	0.49	0.42	0.41	0.48	0.52	0.42	0.41
	(0.012)	(0.012)	(0.015)	(0.016)	(0.015)	(0.015)	(0.012)	(0.013)	(0.014)	(0.013)	(0.013)	(0.014)
Father's Occupation Not Given	0.20	0.19	0.10	0.11	0.21	0.17	0.10	0.10	0.20	0.17	0.12	0.11
	(0.009)	(0.009)	(0.009)	(0.010)	(0.012)	(0.011)	(0.007)	(0.008)	(0.011)	(0.010)	(0.009)	(0.009)
Father in Unskilled Occupation	0.23	0.24	0.11	0.09	0.25	0.22	0.14	0.14	0.22	0.20	0.11	0.09
	(0.010)	(0.010)	(1.110)	(0.009)	(0.013)	(0.012)	(0.008)	(0.009)	(0.011)	(0.010)	(0.009)	(0.008)
Estimated Probability of Employment	0.81	0.81	0.94	0.93	0.63	0.62	0.80	0.81	0.50	0.50	0.72	0.72
	(0.002)	(0.002)	(0.000)	(0.000)	(0.006)	(0.005)	(0.003)	(0.004)	(0.005)	(0.005)	(0.003)	(0.003)
Father in Employment	0.85	0.87	0.91	0.92	0.72	0.73	0.81	0.83	0.68	0.71	0.82	0.83
	(0.008)	(0.008)	(0.009)	(0.009)	(0.014)	(0.013)	(0.009)	(0.010)	(0.013)	(0.012)	(0.010)	(0.011)

Notes: (A) See note (A) to Table 7.9

Turning to the consideration of the performance of individual variables, it can be seen from Table 7.13 that the scaled logistic ability score almost always exerted a positive and significant effect on school leaver's probabilities of continuing into full-time tertiary education.[24] Turning to the family background variables, the effect of father's social class, as proxied by his occupation, does not appear to have been particularly consistent. The relevant variables only achieved significance twelve times out of a possible maximum of thirty six times. When a father's social class variable was significant it most often indicated that school leavers with a father in a professional or intermediate occupation had a greater chance of continuing into full-time tertiary education than other school leavers. In line with the above discussion relating to apprenticeships, in two of the three equations relating to early male school leavers, the coefficient on the variable indicating a father in a skilled occupation was significantly negative. The variable relating to whether school leavers had a father in employment did not perform very well since it had the wrong sign in three of the equations and was only significant in three of the twelve equations (once with the wrong sign). Parents' education had the expected, positive sign in all the estimated equations, however, it was only significant in seven of the twelve equations. The variables relating to the size of school leaver's families performed badly.

The variable relating to school leaver's estimated or imputed probability of employment performed rather erratically, being significant in three out of the four equations relating to 1979 and only significant once thereafter, i.e. in the case of female late school leavers in 1981. Furthermore, although the coefficient on this variable usually had the expected sign when the coefficient was significant, it often had the wrong sign otherwise.

The relatively poor performance of the variables relating to father's social

class and whether the father was in employment may reflect the fact that these variables were more important in determining whether school leavers stayed on at school at the end of their compulsory schooling rather than in influencing their decisions as to whether to continue in full-time tertiary education. The main reason for supposing this is that young people who stay-on at the end of their compulsory schooling do not receive a grant, whereas many young people who continue into full-time tertiary education do receive a grant. Since father's employment and social class are partly proxies for household income, they might therefore be expected to exert a stronger influence on the staying-on decision than the continuation into full-time tertiary education decision. If so, father's employment and social class will have had little role left to play in determining whether school leavers continued into full-time tertiary education, since school leavers will have been effectively sorted according to such characteristics when they were sixteen. In line with the discussion in sub-section 7.2.3, this sorting would result in the variables relating to family background characteristics having low, often insignificant, coefficients, since their effect is already largely captured in the division of school leavers into early and late leavers.

Table 7.15 contains a logistic discriminant equation, which was estimated in order to see if significant differences existed between early and late school leavers in terms of their family background characteristics.[25] It can be seen from Table 7.15 that, even after allowing for the effects of gender and for differences according to which survey school leavers were included in, there still existed highly significant differences between early and late school leavers, suggesting that significant sorting had occurred when school leavers were sixteen.

In order to see if the family background variables had a significant effect on

Table 7.15: A Logistic Discriminant Equation for School Leavers (Dependent Variable is Whether a School Leaver was a Late Leaver)

Independent Variables	Coefficient[1]	T-Statistic
Large Family	-.533**	11.84
Parents' Education	1.408**	22.88
Father in Professional or Intermediate Occupation	1.545**	26.45
Father in Skilled Occupation	.433**	8.95
Father's Occupation Not Given	.04	.71
Female	.257**	7.47
1981 Survey	1.081**	25.35
1983 Survey	.518**	12.14
Constant	-1.372**	25.41
McFadden R-Square	0.14	
X^2 (8)	3257.67**	
N	16580	

Notes: (1) ** indicates significance at the 1% level.

school leavers' probabilities of continuing in full-time tertiary education when taken as a set, they were dropped from the unrestricted equation estimated over all school leavers, i.e. the equation used in computing the chi-squared test statistics reported in Table 7.12. The resulting chi-squared statistic indicated that the variables could not be dropped without significantly reducing the fit of the equation.[26]

The poor performance of the variable relating to school leaver's probabilities of employment is disappointing. The poor performance of this variable is here attributed, firstly, to the modest fit of the probability of employment equations, secondly, to the high collinearity between the estimated employment probabilities and school leaver's scaled logistic ability score and father's employment, thirdly, to the indirect way in which the concept of school leaver's expectations of their employment prospects has had to be operationalised and, finally, to possible sorting according to risk aversion at age 16.[27]

The resulting chi-squared statistic indicates that the variable relating to school leaver's probabilities of employment can not be dropped from the unrestricted equation estimated over all school leavers without significantly reducing the fit of the equation.[28]

Figures 7.6a to 7.6d show some of the information contained in Table 7.13 in a different manner. They show the counter-factual relationship between two "typical" early and late school leaver's probabilities of continuing in full-time tertiary education and their scaled logistic ability scores in 1979, 1981 and 1983.[29] The most striking figure is Figure 7.6b which relates to the early male school leaver and which shows that the probability of them continuing into full-time tertiary education was very weakly related to their scaled logistic

Figure 7.6a The relationship between the probability of continuing into full-time tertiary education and the scaled logistic ability score: female early leavers.

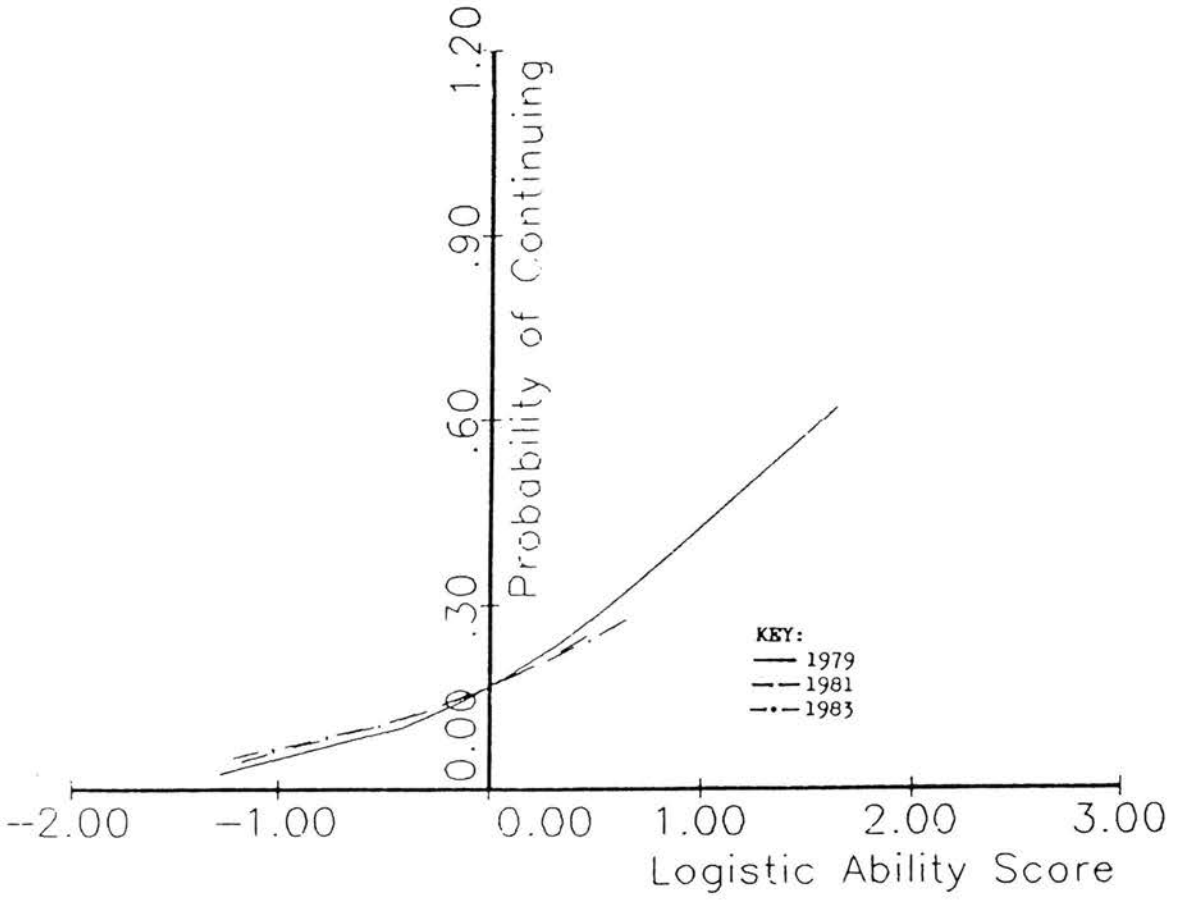


Figure 7.6b The relationship between the probability of continuing into full-time tertiary education and the scaled logistic ability score: male early leavers.

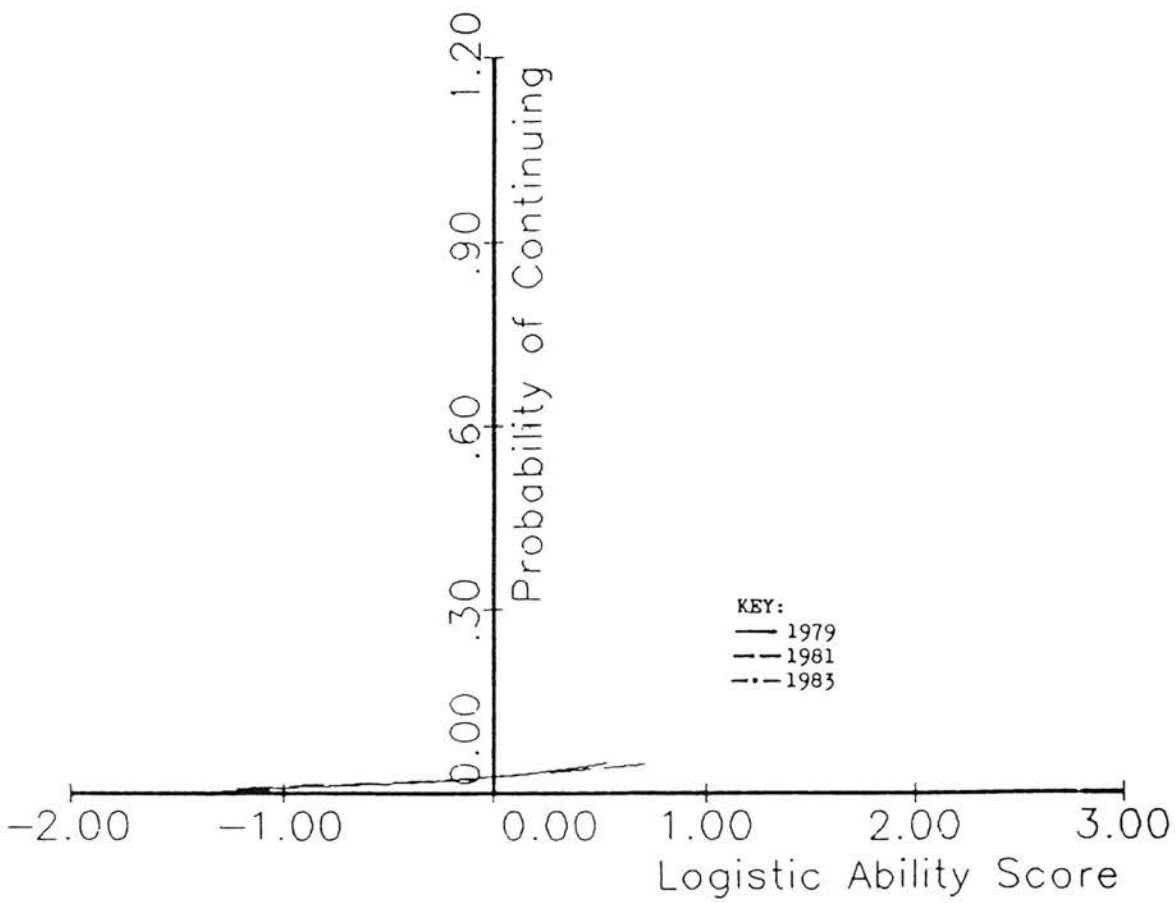


Figure 7.6c The relationship between the probability of continuing into full-time tertiary education and the scaled logistic ability score: female late leavers.

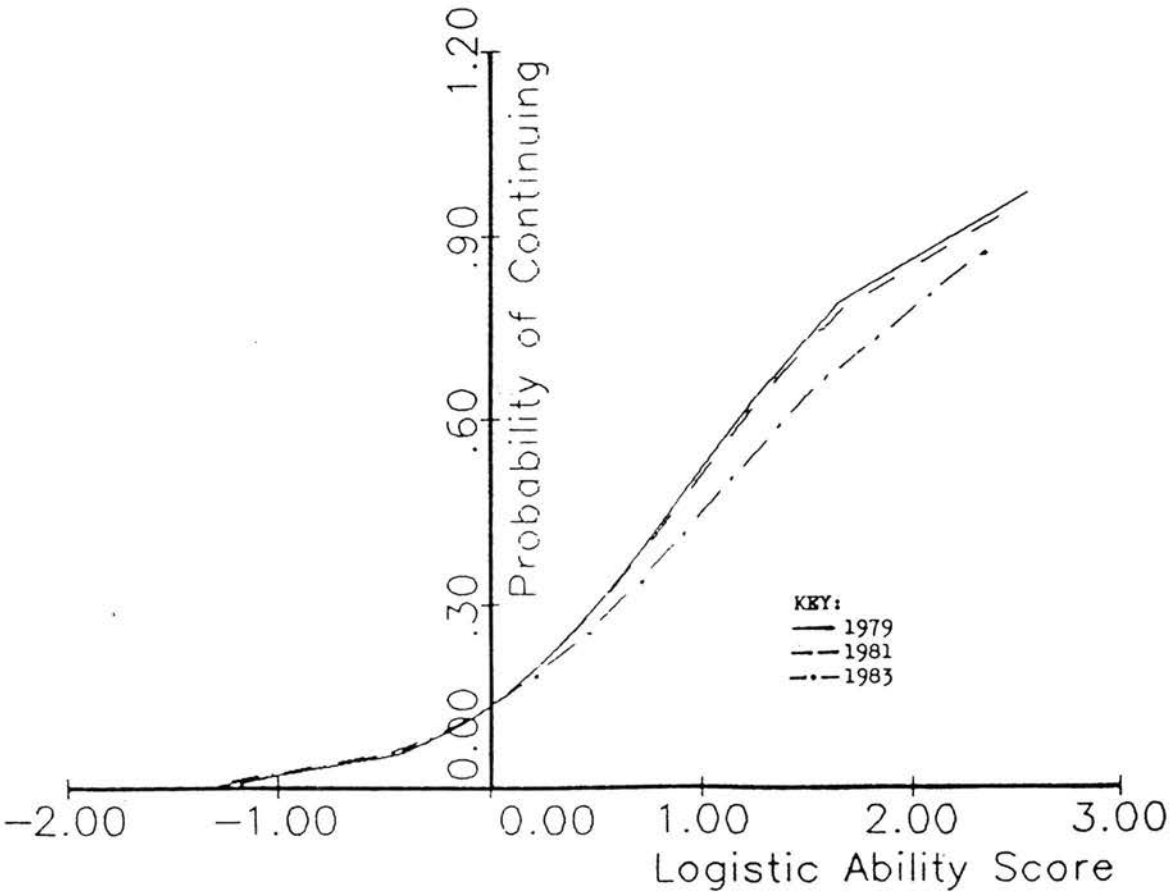
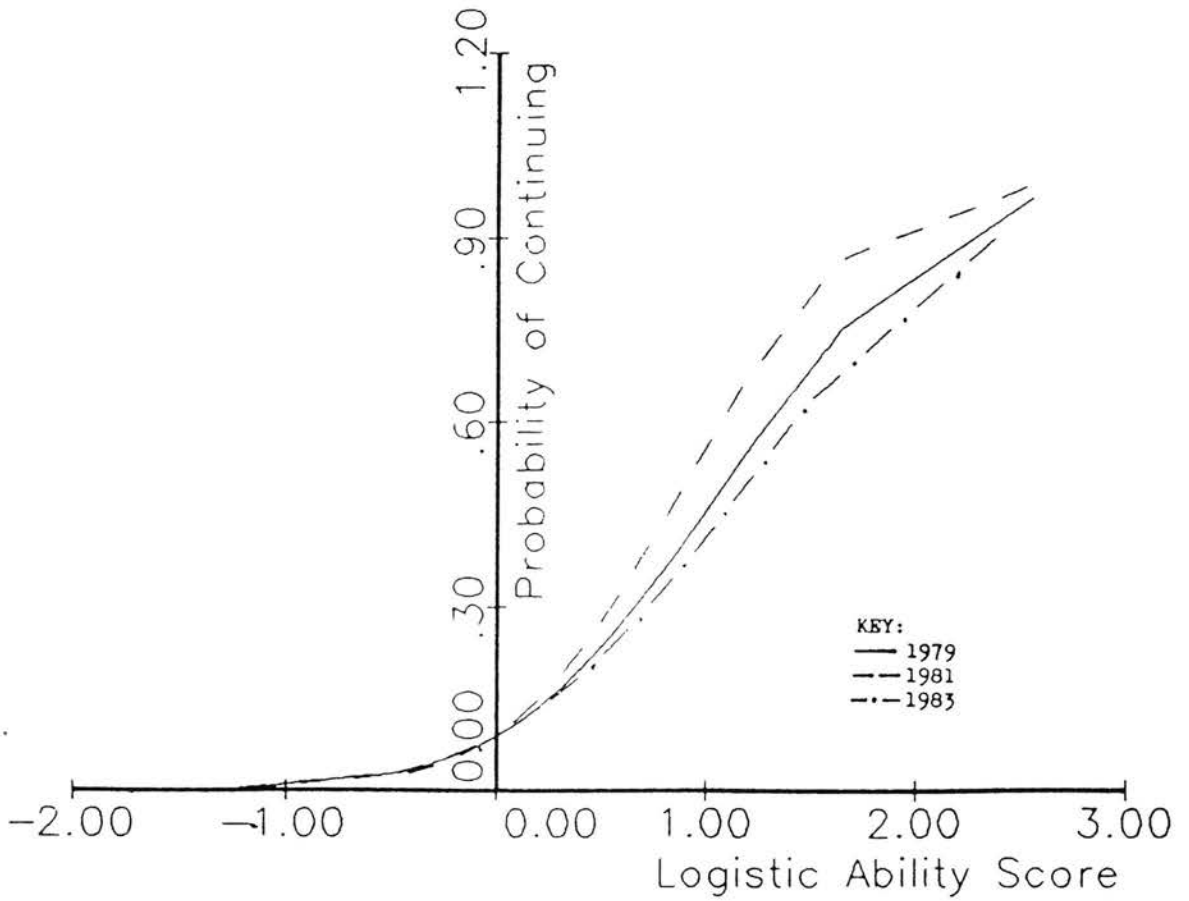


Figure 7.6d The relationship between the probability of continuing into full-time tertiary education and the scaled logistic ability score: male late leavers



ability score, in marked contrast to the situation for the early, female school leavers shown in Figure 7.6a.

It was decided not to present figures showing the relationship between typical early and late school leaver's probabilities of employment and probabilities of continuing into full-time tertiary education because the large intercept terms in the equations relating to male and female late school leavers in 1979 meant that their figures consisted of straight lines at a probability level of approximately 0.99.

Table 7.16a contains the expected probabilities of continuing into full-time tertiary education for stereotypically advantaged and disadvantaged school leavers. The profiles of advantaged and disadvantaged school leavers are briefly described in the footnotes to Table 7.16a and detailed in Table 7.16b.

It can be seen from Table 7.16a that substantial differences existed between the chances that advantaged and disadvantaged late male school leavers would continue into full-time tertiary education. Slightly less substantial differences existed between advantaged and disadvantaged late female school leaver's estimated chances of continuing into full-time tertiary education. This difference in the effect of advantageous and disadvantageous characteristics between late male and female school leavers indicates a greater commitment to continued full-time tertiary education among female school leavers (see above).

It can also be seen from Table 7.16a that, as might be expected, advantaged and disadvantaged early school leavers of both genders had a lower estimated probability of continuing in full-time tertiary education than late leavers. The estimated probabilities for male early leavers were especially low. Among early school leavers, there was a large increase between 1981 and 1983 in the

Table 7.16a The Expected Probability of Continuing in Full-Time Education for Two Stylised Groups of School Leavers

Group:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Survey	1979	1979	1979	1979	1981	1981	1981	1981	1983	1983	1983	1983
When Left School[A]	Early	Early	Late	Late	Early	Early	Late	Late	Early	Early	Late	Late
Gender	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males
(1) "Advantaged"	0.368	0.077	0.850	0.865	0.355	0.053	0.791	[illegible]	[illegible]	0.224	0.854	0.889
(2) "Disadvantaged"	0.025	0.011	0.212	0.077	0.027	0.007	[illegible]	[illegible]	[illegible]	0.001	0.271	0.138
(3) Difference	0.343	0.066	0.638	0.788	0.328	0.046	0.624	0.821	0.607	0.223	0.583	0.751

Notes:
(A) See note (A) to Table 2.

(1) An "advantaged" school leaver: had an employed father who worked in a professional or intermediate occupation, did not come from a large family, at least one of his/her parents attended school beyond 17 years of age, came from an area where the unemployment rate was one standard deviation above the mean for his/her particular group and, finally, had the estimated probability of employment value appropriate for a school leaver from an area with an unemployment rate one standard deviation below the average unemployment rate, who had a scaled logistic ability score a standard deviation above the mean for their group and who had an employed father.

(2) A "disadvantaged" school leaver: had an unemployed father who previously worked in an unskilled occupation, came from a large family, neither of his/her parents attended school beyond 17 years of age, came from an area where the unemployment rate was one standard deviation above the average unemployment rate, had a scaled logistic ability score a standard deviation below the mean for his/her particular group, and, finally, had the estimated probability of employment value appropriate for a school leaver with an unemployed father, who had a scaled logistic ability score a standard deviation below the mean for his/her particular group and who came from an area with an unemployment rate a standard deviation above the average unemployment rate.

(3) See Table 7.16b for the actual values of the independent variables used in calculating the expected probabilities.

Table 7.16b The Profiles of Advantaged and Disadvantaged School Leavers as Used in Calculating the Contents of Table 7.16a

Group:	(1)		(2)		(3)		(4)		(5)		(6)	
Survey	1979		1979		1979		1979		1981		1981	
When Left School[A]	Early		Early		Late		Late		Early		Early	
Gender	Females		Males		Females		Males		Females		Males	
Variables:	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan
From a Large Family	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Logistic Ability Score	0.09	-1.20	0.08	-1.26	1.72	0.40	1.79	0.56	0.10	-1.15	0.08	-1.15
Either Parent Left School Aged 17+	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
Father in Professional or Intermediate Occupn	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
Father in Unskilled Occupation	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Estimated Probability of Employment	0.93	0.58	0.93	0.57	0.94	0.90	0.94	0.90	0.89	0.31	0.88	0.31
Father in Employment	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
Variables in The Probability of Employment Equations												
Logistic Ability Score	0.09	-1.20	0.08	-1.26	1.72	0.40	1.79	0.56	0.10	-1.15	0.08	-1.15
Local Unemployment Rate	4.7	12.3	4.7	12.3	4.7	12.3	4.7	12.3	8.3	16.3	8.3	16.3
Father in Employment	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO

Notes: (A) see note (A) to Table 7.9.

Table 7.16b (cont) The Profiles of Advantaged and Disadvantaged School Leavers as Used in Calculating the Contents of Table 7.16a

(7) 1981 Late Females		(8) 1981 Late Males		(9) 1983 Early Females		(10) 1983 Early Males		(11) 1983 Late Females		(12) 1983 Late Males	
Advan	Disadvan	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan
NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
1.49	-0.20	1.57	-0.22	0.12	-1.27	0.15	-1.31	1.57	0.10	1.57	0.10
YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
0.95	0.51	0.96	0.51	0.81	0.20	0.82	0.20	0.86	0.49	0.86	0.49
YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
1.49	-0.20	1.57	-0.22	0.12	-1.27	0.15	-1.31	1.57	0.10	1.57	0.10
8.3	16.3	8.3	16.2	10.5	19.1	10.5	19.1	10.5	19.1	10.5	19.1
YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO

estimated probability of an advantaged school leaver of either gender continuing into full-time tertiary education, which may reflect a somewhat delayed response to the effect of the deterioration in school leavers' employment prospects after 1979. Comparing the genders, both advantaged and disadvantaged early female school leavers were noticeably more likely to continue in full-time education than their male counterparts.

7.5.4. The Estimated Probabilities of Observing Two Stylised Types of School Leavers to be in Employment, Non-employment or Continued Full-Time Tertiary Education in 1979, 1981 and 1983

The aim in this sub-section is to use the estimates contained in Tables 7.9 and 7.13 in conjunction with the profiles for stereotypically advantaged and disadvantaged early and late school leavers in order to estimate the probability of observing such school leavers to have been in employment, non-employment or continued full-time tertiary education in 1979, 1981 and 1983, and to see how the estimated probabilities differed between the genders and between survey years. To that end, Table 7.17 shows the expected probabilities for the two stylised groups of school leavers. The characteristics attributed to advantaged and disadvantaged school leavers are the same as used in constructing Table 7.16a and as detailed in Table 7.16b.

The estimated probabilities contained in Table 7.17 were obtained in the following manner. The probability of a school leaver being observed in full-time tertiary education was simply taken from Table 7.16a. The probability of a school leaver being observed in employment was calculated by multiplying the appropriate probability of employment taken from Table 7.11a by one minus the appropriate probability of continuing into full-time tertiary education taken from Table 7.16a. Finally, the probability of being observed in non-employment was calculated by multiplying one minus the appropriate probability of continuing in

Table 7.17 The Probabilities of Two Stylised Groups of School Leavers Being Observed in Full-Time Education, Employment or Non-employment[1]

Group	(1)		(2)		(3)		(4)		(5)		(6)	
Survey	1979		1979		1979		1979		1981		1981	
When Left School[A]	Early		Early		Late		Late		Early		Early	
Gender	Females		Males		Females		Males		Females		Males	
Estimated Probabilities:	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan
Probability of Being Observed in Full-Time Education	0.368	0.025	0.077	0.011	0.850	0.212	0.365	0.077	0.755	0.027	0.053	0.007
Probability of Being Observed in Employment	0.588	0.566	0.858	0.564	0.141	0.709	0.127	0.871	0.674	0.302	0.833	0.308
Probability of Being Observed in Nonemployment	0.044	0.410	0.065	0.425	0.009	0.079	0.008	0.052	0.071	0.671	0.114	0.685
Total	1.000	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Notes: (A) See Note A to Table 7.9.
(1) The definitions of advantaged and disadvantaged school leavers are given in Tables 7.16a and 7.16b.

Table 7.17 (cont) The Probabilities of Two Stylised Groups of School Leavers Being Observed in Full-Time Education, Employment or Non-employment[1]

(7)		(8)		(9)		(10)		(11)		(12)	
1981		1981		1983		1983		1983		1983	
Late		Late		Early		Early		Late		Late	
Females		Males		Females		Males		Females		Males	
Advan	Disadvan	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan	Advan	Disadvan
0.791	0.167	0.838	0.017	0.649	0.042	0.224	0.001	0.854	0.271	0.880	0.138
0.199	0.425	0.156	0.501	0.285	0.192	0.636	0.200	0.126	0.357	0.103	0.422
0.010	0.408	0.007	0.481	0.067	0.766	0.140	0.799	0.020	0.372	0.017	0.440
1.000	1.000	1.001	0.999	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000

full-time tertiary education by one minus the appropriate probability of employment.

From Table 7.17 it can be seen that the most noticeable change, between 1979 and 1983, was the increase in, all but advantaged male and female late leaver's, estimated chances of ending up in non-employment. For instance, in 1979 disadvantaged early male and female leavers had a just over 40% probability of being observed in non-employment, by 1983 this probability was nearly 80%. It can also be seen from the table that disadvantaged late male and female leavers experienced a substantial increase in their estimated probabilities of ending up in non-employment, from less than 10% for both genders in 1979 to 37% for females, and 44% for males, in 1983. This rise in their estimated probability of ending up in non-employment was accompanied by an increased estimated probability of continuing into full-time tertiary education. In contrast to other types of school leavers, advantaged late school leavers (of both genders) experienced very little change in their estimated probabilities of being observed in the three states between 1979 and 1983. This reflected their continued high estimated probability of continuing into full-time tertiary education and their advantages in the competition for jobs; their principal advantages being that they were more able/better qualified and mature than other school leavers.

7.6. Conclusion

It was argued in the introduction to this Chapter that school leaver's decisions as to whether to undertake a course of full-time tertiary education hold important implications for both society and their own future welfare. The contents of this Chapter represent an attempt to examine the determinants of those decisions in an econometric framework. A particular aim has been to establish what role, if any, school leaver's expectations of their employment

prospects played in determining their decisions. The initial examination of Scottish young people's post-school destinations indicated that sizeable differences in the proportion continuing into full-time tertiary education existed between school leavers according to their gender, which survey they were included in, and, according to whether they left school at the earliest possible opportunity or undertook some post-compulsory secondary schooling.

The literature survey produced both a list of variables to be taken into account when estimating the equations relating to school leaver's probabilities of continuing into full-time tertiary education and their probabilities of employment, and, raised the important issue of sorting. It was argued that sorting in the educational system, according to family background characteristics, produces an increasingly homogeneous set of students. Consequently, variables relating to such characteristics can be expected to become steadily less important in determining the progression from one stage to another in the educational system because, in a sense, the effect of such characteristics is already contained in student's previous transitions.

Turning to the econometric results, it was discovered that the process generating school leaver's probabilities of employment differed according to whether they were early or late leavers and according to the survey in which they were included. After stratifying the sample according to these variables, it was discovered that school leaver's employment chances were, usually, positively related to their ability and to their having a father in employment, and negatively related to the local unemployment rate. Late school leavers in 1979 appeared to differ from other school leavers with respect to the process generating their employment probabilities. It was argued that this probably reflected a situation of excess demand or equilibrium in the market for their labour.

The results of the model fitting procedure on the probability of continued full-time tertiary education equation indicated that the process generating the probabilities differed according to school leaver's gender, the survey they were included in and whether they were early or late leavers. After stratifying the sample according to these variables, it was discovered that the resulting equations fitted the data for late school leavers much better than for early school leavers and fitted worst of all for early male school leavers. The latter result was attributed to the fact that many early male school leavers faced a three way choice between continued full-time tertiary education, an apprenticeship, and, a non-apprenticed job. In terms of individual variables it was discovered that school leaver's probabilities of continuing into full-time tertiary education were positively related to their ability, whilst most of the family background variables performed poorly, with the exception of parents' education.

The poor overall performance of the family background variables was attributed to prior sorting of the type described above. A logistic discriminant equation provided evidence that significant sorting had occurred at the point when young people had decided whether to undertake post-compulsory schooling. The variable relating to school leaver's estimated or imputed probabilities of employment also performed quite poorly and this was attributed to a combination of collinearity, the modest fit of the probability of employment equations, the indirect way in which school leaver's expectations of their employment prospects had to be modelled and prior sorting according to risk aversion at age 16.

By way of an experiment school leaver's estimated or imputed probabilities of employment were replaced by the local unemployment rate in the probability of continued full-time tertiary education equation and the model fitting

procedure performed again. The results are shown in Tables 7.18 and 7.19. The main difference between the results contained in Tables 7.12 and 7.13 and those contained in Tables 7.18 and 7.19 is that when the local unemployment rate is used, the data from the 1979 and 1981 samples can be combined in estimation. It can be seen from Table 7.19 that the local unemployment rate also did not perform very well, only being significant in the equations relating to late male and female school leavers in 1979 and 1981.

In conclusion, it appears that by the time young people came to make their decisions whether to continue in full-time tertiary education the only variable which exerted a consistently significant influence was their ability; and to that extent the process appeared to be meritocratic. However, a great deal of sorting had taken place prior to that point and the transition through the upper reaches of secondary schooling was from meritocratic with significant sorting apparently occurring at age 16. This suggests that if amongst the aims of policy there are those of raising the general level of educational attainment and of providing equal access to educational opportunities regardless of family background, then a policy of supporting students in tertiary education alone is insufficient. Policies aimed at supporting young people during post-compulsory schooling and at encouraging young people from disadvantaged backgrounds to undertake such education are also required.

Table 7.18: Results of Hypothesis Tests on The Probability of Continuing in Full-Time Tertiary Education Equation
(Note: Travel to Work Area Unemployment Rate Used in Place of School Leaver's Probability of Employment)

Hypothesis	Test Statistic(1)(2)
1. That the process was the same for both genders	296.2**
2. That the process was the same for early and late leavers	123.8**
3. That the process was the same in 1979 and 1981	12.8
4. That the process was the same in 1981 and 1983	58.0**
5. That the process was the same in 1979 and 1983	64.4**

Notes: (1) The test statistic is distributed as chi-squared with 9 degrees of freedom.

(2) ** indicates significance of the 1% level.

Table 7.19: The Estimated Probability of Continued Full-Time Tertiary Education Equations
(Note: Travel to Work Unemployment Rate Used in Place of School Leaver's Probability of Employment.)(1)

Group	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Gender	Female	Male	Female	Male	Female	Male	Female	Male
Early or Late Leavers^	Early	Early	Late	Late	Early	Early	Late	Late
Survey(s)	1979 & 1981	1979 & 1981	1979 & 1981	1979 & 1981	1983	1983	1983	1983
Descriptive Variable:								
Large Family	-.100	-.169	-.031	-.111	-.103	-.338	.032	-.174
	(1.26)	(1.22)	(0.41)	(1.16)	(0.77)	(1.38)	(0.29)	(1.32)
Logistic Ability Score	.619**	.360**	.971**	1.313**	.635**	.438**	.951**	1.251**
	(10.54)	(3.99)	(21.68)	(25.48)	(7.70)	(3.89)	(14.3)	(16.44)
Parents' Education	.428**	.119	.311**	.178*	.528**	.591**	.319**	.171*
	(3.06)	(0.61)	(4.62)	(2.32)	(2.77)	(3.02)	(3.24)	(1.64)
Father in Professional or Intermediate Occupation	.275**	.129	.255**	.496**	.511**	.529*	.283*	-.006
	(2.46)	(0.81)	(2.87)	(4.35)	(3.24)	(1.89)	(2.11)	(0.04)
Father in Skilled Occupation	-.027	-.337**	-.024	.222*	.016	.397	.117	-.138
	(0.32)	(2.44)	(0.29)	(1.98)	(0.13)	(1.63)	(0.93)	(0.93)
Father's Occupation Not Given	.234*	.066	.051	.604**	.130	.812**	.126	-.054
	(1.86)	(0.35)	(0.42)	(3.93)	(0.86)	(2.98)	(0.79)	(0.29)
Local Unemployment Rate	.007	.008	.032**	.035**	-.008	-.011	.004	-.005
	(0.80)	(0.55)	(4.69)	(4.26)	(0.72)	(0.66)	(0.38)	(0.46)
Father in Employment	.143	.219	-.032	.206*	.018	.085	-.272**	-.007
	(1.20)	(1.15)	(0.35)	(1.73)	(0.16)	(0.48)	2.55)	(0.06)
Constant	-1.261**	-1.988**	-1.475**	-2.356**	-.662**	-1.920**	-.814**	-.909**
	(7.38)	(7.42)	(10.17)	(12.08)	(2.80)	(5.05)	(3.79)	(3.65)
McFadden R-Square	0.09	0.06	0.23	0.37	0.10	0.10	0.19	0.26
$X^2(8)$	180.90**	39.32**	898.53**	1288.70**	110.79**	47.48**	355.72**	441.67**
N	2908	2948	2889	2464	1286	1514	1340	1231

Notes (1) ** denotes significance at the 1% level
* denotes significance at the 5% level

(A) See note (A) to Table 7.9

Footnotes

1. It is implicitly being assumed that education is not equalising on its costs. That is, it is assumed that even after subtracting the costs of educational investments, individuals who undertake such investments still have a higher present value of lifetime earnings than those who do not.

2. A small minority of school leavers neither enter the labour market nor continue in full-time education (see Table 7.1).

3. The principal scheme for the young unemployed in 1978/79, 1980/81 and 1982/83 was the Youth Opportunities Programme, which aimed to prepare young people for the world of work and to provide them with work experience (see Appendix 6.1).

4. Rational expectations are expectations based upon the full information set available to individuals and are derived from a model of the true, underlying event generating process. Such expectations possess the quality that their forecast error, i.e. the difference between actual and expected values, has a mean value of zero, i.e. such forecasts are unbiased. See Sheffrin (1983) for a well written account of the nature of rational expectations and their use in economic models.

5. The data from which Table 7.1 was constructed is an unrestricted version of the data used in estimation (see sub-section 7.4.1). Table 7.1 is based upon weighted data.

6. In Scotland, those young people who reach the age of 16 by the end of February in their fourth form are entitled to leave school at the Christmas of the fourth form. Those young people who reach the age of 16 before the following October are entitled to leave school in the summer of their fourth form. Finally, those young people whose 16th birthday falls in the October of their fifth form or later are entitled to leave school at Christmas of their fifth form (Burnhill, 1984a).

7. The introduction of YTS, with its strong emphasis on training, may have given young people the option of accumulating human capital in the labour market as well as through the education system. It may be that some young people chose to exercise the option to accumulate human capital via YTS in 1984. Previous to 1984, the information contained in Figure 7.2 is strongly suggestive of a discouraged worker effect in operation.

8. Main and Raffe (1983b), Raffe (1984f), Main (1985a) and Main (1985b) use data from the SEDA in order to examine the factors which influenced Scottish school leaver's probabilities of employment.

   Payne and Payne (1984) use data from The General Household Survey for the years 1974 to 1981 to examine the determinants of the probability that 16 to 19 year olds would be found to be employed rather than unemployed.

   Breen (1984) and Breen (1986) use data from The National Manpower Service's annual survey of Irish school leavers to examine school leaver's probabilities of unemployment and rate of job acquisition, respectively.

9. Conlisk (1969), and Edwards (1975) were cross-section studies of post-compulsory secondary schooling enrolment rates in the U.S. Duncan (1965) is a study of post-compulsory secondary schooling rates in the U.S. up till 1960. Mattila (1982) is a time-series study of young people's decisions whether to finish High School, enter college and finish college, respectively, in the U.S.

   Gregory and Duncan (1980) is a time-series study of teenage labour market participation rates in Australia. Merrilees (1981) is a time-series study of post-compulsory secondary schooling enrolment rates in Australia.

10. Pissarides (1982) is a time-series study of the proportion of qualified leavers entering university in England and Wales. Pissarides (1981) is a study of the proportion of 16 year olds continuing in school in England and Wales.

11. In the U.S., the studies of young people's educational choices have taken three main forms: activity studies, a study of the transition through the educational system, and, studies of college-going behaviour. The activity studies (Korbel, 1966; Lerman, 1972; Gustman and Steinmeier, 1981; and Stephenson, 1982) examined the determinants of young people's choice of activity state at various times during their teenage years and early twenties. The aim of such studies was to discover what determined whether, at any point in their immediate post-compulsory schooling biography, young people were in school or had schooling as their major activity.

    The study by Mare (1980) examines young people's transitions through the educational process and attempts to discover which factors were important in determining whether young people continued in education at various watershed points, e.g. end of compulsory schooling, end of secondary schooling, end of college etc.

    The studies by Radner and Miller, 1970; Kohn *et al*, 1976; Willis and Rosen, 1979; Meyer and Wise, 1982; and, Borus and Carpenter, 1984; sought to discover which factors were influential in determining whether High School graduates chose to go to college.

12. Breen (1984) included an examination of the determinants of whether young Irish people would choose to continue in school at the end of their compulsory secondary schooling. Raftery and Hout (1985) is a study of young Irish people's transition through secondary schooling and, for some, into tertiary education.

13. Rice (1985) used information relating to 575 sixteen and seventeen year olds drawn from the 1976 Family Expenditure Survey to fit a probit equation relating to whether young people chose to continue in school or at a College of Further Education at the end of their compulsory schooling.

14. Micklewright (1987) used data from the third and fourth sweeps of The National Child Development Survey, conducted in 1974 and 1981 respectively, to estimate a logit equation relating to the probability that, in 1974, young people in England and Wales would have chosen to leave school at the minimum school leaving age of sixteen. The sample used in estimation contained data on 5304 individuals. Separate equations were

fitted for males and females.

15. In the following discussion it is assumed that young people face a two way choice between continuing in full-time tertiary education or entering the labour market. This assumption is actually a simplification of reality since young people could also decide to stay in the home and engage in household production (this is particularly true for females), enter the labour market and engage in part-time study, enter the labour market and look for a job which offers training, i.e. engage in on-the-job human capital accumulation, completely drop out etc. Since the vast majority of school leavers either enter the labour market or continue in full-time education, and since it is not possible to discover whether, and to what extent, school leavers in the labour market are actually voluntarily unemployed and engaging in household production, or, in work and receiving on-the-job training, the assumption of a dichotomous choice is not an unreasonable simplification.

16. The assumption of an infinite horizon for school leavers is not too restrictive since any reasonable choice of discount rate will ensure that differences in earnings towards the end of the life-cycle are very heavily discounted and, hence, a finite lifetime correction makes little difference (see Willis and Rosen (1979), p512).

17. It is implicitly assumed here that unemployment benefit is less than the wage a school leaver would receive in employment. This is in line with the standard result in search theory that individuals will rationally set their reservation wage above the level of unemployment benefit and that individuals will only be found in jobs which pay a wage greater than their reservation wage. (See Lancaster and Chesher, 1983 for a discussion of such issues within the framework of a search model.)

18. This is a partial equilibrium approach, because if those school leavers who continued into full-time tertiary education had actually entered the labour market the estimated probabilities of employment, and hence the fitted values derived from the estimated equations, might well have been quite different.

19. Willms' (1986) described his logit transformation in the following manner:

    "The logit technique assumes that each award category, or each attainment category, represents a score on an underlying logit distribution (similar to a normal distribution, but with fatter tails), and divides the distribution into pieces according to the percentage of pupils in each award of attainment category. The scaled score is then the centre of gravity of each piece." Willms (1986), p.229. (Parenthesis in the original.)

20. The McFadden R-Squared used here measures the proportionate reduction in the log likelihood for the sample brought about by using the estimated probabilities derived from the fitted equation to predict whether school leavers would be found in employment rather than assuming that the probability was a constant, equal to the sample mean of the dependent variable, i.e. the observed proportion in employment (Maddala, 1983, p40).

21. This particular equation was re-estimated using two different packages (SPSS and LIMDEP), estimated using two different algorithms and also

given a set of starting values consistent with the other equations but all to no avail. It always converged to the parameter values shown in Table 7.9.

22. This "stereotypical" approach, that is, constructing stereotypes of advantaged and disadvantaged individuals and comparing the estimated probabilities is commonly used in studies which employ qualitative response estimating techniques because the actual, estimated coefficients are difficult to interpret in a meaningful way. (See Meyer and Wise, 1982; and Main, 1987; for examples of this technique.)

23. See Bennett and Carter, (1982) for a discussion of the difficulties young females face in attempting to enter apprenticeships and Lee and Wrench (1983) for an account of age restrictions relating to apprenticeships and the advantages of having a father in a skilled occupation.

24. The only exception being in the case of early male school leavers in 1981.

25. Logistic discriminant equations can be used to classify an individual as coming from a particular group based upon a vector of characteristics, or, obversely, they can be used to see if significant differences in individual characteristics exist between groups. A significant coefficient in a logistic discriminant equation does not allow us to make the strong statement that the relevant variable *causes* individuals to belong to a group, rather it only allows us to make the weaker statement that a significant difference exists between groups with respect to that variable. (Maddala, 1983; Ch 4).

26. The chi-squared statistic had a value of 216.4 with 30 degrees of freedom and was therefore significant at the 1% level (50.9 is the 1% significance level).

27. The Pearson correlation coefficient between school leaver's probabilities of employment and their scaled logistic ability scores and the variable indicating whether their father was employed or not were usually around 0.8 and 0.5 in value and significant at the 1% level.

28. The chi-squared statistic had a value of 51.6 with five degrees of freedom and was therefore significant at the 1% level (15.09 is the 1% significance level).

29. The baseline probabilities for early school leavers relate to a school leaver who had the average 1979 probability of employment for their gender who had a father in an unskilled occupation, neither of whose parents continued in school beyond sixteen years of age, whose father was employed and who did not come from a large family. The baseline probabilities for late school leavers relate to a school leaver who had the average probability of employment for their gender in 1979, who had a father in a professional or intermediate occupation, whose father was employed, at least one of whose parents had continued in school beyond sixteen years of age and who did not come from a large family. These characteristics were designed to be representative of early and late school leavers in 1979 and were based on the examination of sample proportions.

CHAPTER 8

CONCLUSION

8.1. The Beginning of The End

The two aims in this short final Chapter are to review the main conclusions from each of the seven preceding Chapters and to make a few concluding remarks. Since the Thesis began with an "any questions" section it seemed appropriate to end with an "any answers" section.

8.2. Any Answers?

The central set of questions examined and addressed in this Thesis were:

1. What were the major changes in Scottish young people's post-school destinations over the period 1977 to 1983? Why did young peoples' employment decline? (Chapter One)

The major change in Scottish young people's post-school destinations over the period 1977 to 1983 was the decline in the proportion entering employment. Other changes included the increase in the proportion continuing into full-time tertiary education, and, increasing State intervention in the youth labour market via schemes for the young unemployed.

The most convincing account of the decline in young peoples' employment is that provided by the demand deficiency explanation, wherein the decline in young peoples' employment is attributed to a combination of their vulnerable labour market position and the sharp decline in the level of economic activity from 1979 onwards. The combination of a decline in employer's recruitment, the lengthening of employer's labour queues and the displacement of young people, by older workers, at the front of labour queues most probably accounted for the bulk of Scottish school leavers' employment decline from

1979 onwards.

2. In which industries did Scottish school leavers find work, how did their industrial distribution of employment change, and what did the industrial pattern of their employment change look like, between 1977 and 1983? (Chapter Two).

It was discovered that male and female school leavers' industrial distributions of employment were quite different. Female school leavers' employment was concentrated in the service industries, whilst male school leavers' was more equally spread between the manufacturing and service industries. Between 1977 and 1983, female school leavers experienced a large shift in their employment toward the service industries at the expense of the manufacturing industries, whereas males did not because changes in the relative importance of individual industrial categories within the manufacturing and service sectors tended to offset one another. Male school leavers experienced a shift towards the construction industry, in contrast to female school leavers and all age employees.

Between 1977 and 1983, both male and female school leavers' total employment nearly halved. In the case of female school leavers, Distributive Trades; Clothing and Footwear etc., and, Miscellaneous Services between them accounted for 47% of their employment decline. In the case of male school leavers, Miscellaneous Services; Shipbuilding, Marine Engineering and Vehicles; Construction, and, Public Administration and Defence together accounted for 44.3% of their employment decline. However, in the case of male school leavers' employment decline in Miscellaneous Services, industrial re-classification problems caused an exaggeration of the true decline.

Whilst it was the manufacturing industries that initiated the decline in

school leavers' employment, after 1981 it was the service industries which contributed the greatest part to their employment decline. This temporal pattern closely matched that of all ages' employment, suggesting a close link between all ages' and school leavers' employment. Finally, the decline in school leavers' employment, over the entire period 1977 to 1983, was broadly gender neutral, i.e. males and females suffered equal proportionate employment declines.

> 3. In which occupations did Scottish school leavers work, how did the occupational distribution of their employment change, what did the occupational pattern of their employment change look like, and did the occupational gender segregation of their employment change between 1977 and 1983? (Chapter Three)

Male and female school leavers had quite different occupational distributions of employment. Female school leavers' employment was concentrated in clerical, sales, personal service, and clothing industry related occupations. Males' employment was concentrated in manual occupations and, to a lesser extent than females', clerical occupations. Between 1977 and 1983, male school leavers' occupational distribution of employment was remarkably stable. In contrast, female school leavers experienced a notable shift towards non-manual occupations and away from manual occupations.

School leavers experienced the largest decline in their employment in manual and less skilled non-manual occupations, whilst what little employment they had in professional and technical occupations held up reasonably well. Female school leavers experienced 85% of their net decline in employment, over the period 1977 to 1983, in just four occupational categories: Clerical

Occupations etc.; Non-Transferable Craftsmen (mainly clothing manufacturing occupations); Sales Occupations, and, Other Operatives (factory hands). Male school leavers experienced 72% of their net employment decline, over the period 1977 to 1983, in just five occupational categories: Engineering Craftsmen; Other Operatives; Skilled Operatives; Non-Transferable Craftsmen; and, Technicians, Draughtsmen. Thus, school leavers' net decline in employment was highly concentrated.

Finally, after 1979, the gender segregation of school leavers' employment increased.

> 4. What role did changes in the industrial distribution of Scottish school leavers' employment play in determining the changes in their occupational distribution of employment? (Chapter Four)

In most cases, the largest part of the net shift in school leavers' employment in each occupational category, i.e. the change in school leavers' employment in each occupational category due to the change in that occupational category's share of school leavers' total employment, was attributable to the industry shift effect, i.e. the changes in school leavers' industrial distribution of employment. Female school leavers' net shifts were usually larger than males', principally because their industry shift effects were larger.

> 5. To what extent can the decline in Scottish school leavers' employment over the sub-periods 1977 to 1981, and, 1979 to 1983 be attributed to the decline in all ages' employment in Scotland, to what extent can it be attributed to structural factors and, finally, to what extent can it be attributed to the peculiar

vulnerability of their employment in periods of high unemployment? Also, how similar were Scottish all ages' and school leavers' industrial distributions of employment in 1977, 1979, 1981 and 1983? (Chapter Five)

The largest component of school leavers' employment decline between 1977 and 1981, and, between 1979 and 1983, was that part attributable to the decline in industry's recruitment ratios, i.e. the disproportionate size (compared to all ages) of the decline in school leavers' employment. The next largest component was, usually, that part attributable to the decline in all ages' total employment. The least important component was, usually, that part attributable to structural change.

It was argued in Chapter Five that it is important to compare like with like, and to compare school leavers with full-time all ages workers otherwise the results of the shift-share decomposition tend to exaggerate the recruitment ratio component mainly at the expense of the component attributable to the decline in all ages' total employment.

Turning to the comparison of all ages' and school leavers' industrial distributions of employment, it was argued that school leavers' under-representation, relative to all ages, in the manufacturing industries often reflected a long term decline in all ages' employment and/or the effects of legal minimum age restrictions, e.g. for shiftwork. In other, service, industries it was argued that it often reflected the intensive use of part-time workers, legal minimum age restrictions, e.g. in the drinks trade, and/or the need for age-related professional and advanced educational qualifications. It was also argued that school leavers appeared to be over-represented, compared to all ages, in industries in which initial training is required, e.g. banking and

engineering; because they are better suited to such training than older workers, due to their greater adaptability. Furthermore, young people are better able to live on trainees' wages than older workers and have a greater incentive to undertake training than older workers because they have a longer time in which to recoup their investments. Finally, it was discovered that industrial re-classification problems complicated the analysis of the relationship between school leavers' and all ages' industrial distributions of employment.

> 6. Has the bottom dropped out of the market for Scottish school leavers' labour? That is, did changes in the levels of school leavers' employment and supply of labour to the market combine with changes in employer's hiring standards and changes in the educational attainment of those school leavers in the labour market in such a way as to bring about a very large increase in unqualified and less qualified school leavers' non-employment, whilst leaving their well qualified counterparts' non-employment little changed? (Chapter Six)

Undoubtedly, the bottom did drop out of the market for Scottish school leavers' labour between 1977 and 1983. In 1977, the unqualified and less qualified had much higher rates of non-employment than their better qualified counterparts. Moreover, between 1977 and 1983, the unqualified and less qualified experienced the largest percentage point increases in their non-employment rates.

The decline in school leavers' total employment was *the* major cause of the increase in their total non-employment. This increase was slightly offset by a decline in school leavers' total labour supply.

The composition of school leavers' employment altered, between 1977 and

1983, in such a way as to augment the increase in non-employment experienced by the unqualified and less qualified, and so as to help offset the increase in non-employment experienced by the better qualified. The changes in the composition of school leavers' employment mainly reflected the raising of hiring standards within occupations, rather than changes in their occupational distribution of employment.

School leavers' labour supply behaviour altered in response to the increase in their non-employment. By a mixture of increased "signalling", i.e. qualification acquisition, and the discouraged worker/encouraged student effect, the composition of school leavers' labour supply was so changed as to often offset, and occasionally overwhelm, the composition induced changes in their employment. The result was a less clear cut relationship between the increase in school leavers' non-employment and their educational attainment than might have been anticipated from a study of employment trends.

7. What factors determined whether Scottish school leavers chose to continue in full-time tertiary education at the end of their secondary schooling and did their employment prospects play a role in their decisions? (Chapter Seven)

The most important factor which, on the basis of the econometric results, appears to have determined whether school leavers chose to continue in full-time tertiary education was their scaled logistic ability score, i.e. a logistic re-scaling of a measure of their highest educational attainment. School leaver's employment prospects, as proxied by either the fitted and imputed values from a probit equation or the local unemployment rate, do not appear to have played a significant role in their decisions. Furthermore, family background measures did not appear to exert any systematic and significant effect either. However,

the process generating their probabilities of continuing into part-time tertiary education was found to have significantly differed according to school leaver's gender, the survey in which they were included and whether they had already undertaken post-compulsory schooling.

It was argued that prior sorting of school leavers at age 16, i.e. when a voluntary staying-on decision had to be made, had had the effect of reducing the variation in, and impact of, family background measures. The apparent unimportance of school leaver's employment prospects was argued to have reflected the way in which they had to be modelled, collinearity among the independent variables and prior sorting according to risk aversion at age 16.

8.3. Swansong

During the period in which this Thesis was in preparation, i.e. from late 1983, there has been a change in the general perception of youth joblessness. As Main and Raffe (1983a) argued, youth joblessness was then seen as *the problem* and the central question was how youth joblessness could be reduced. The introduction of The Youth Training Scheme, in April 1983, saw a shift in the focus of the debate towards the question of what was the best thing for the young jobless *given that high levels of youth joblessness would persist into the foreseeable future*. The debate correspondingly shifted away from the best way to increase youth employment towards the context and content of YTS, the effectiveness of YTS, the need for greater vocational training in schools etc. Given that the level of youth employment appears to be so closely tied to the general level of economic activity and that since 1976, at least, successive UK. governments have been predominantly committed to the control of inflation and have, consequently, been reluctant to operate expansionary fiscal and monetary policies, this shift in the debate was inevitable.

The contents of this Thesis can, therefore, be set in context by viewing them as a study of the rise of youth joblessness and its initial consequences. Presently, and for the foreseeable future, the study of how individuals, institutions and policies have adapted, and continue to adapt, in an era of persistently high youth joblessness forms the central focus in the study of youth labour markets. However, it is necessary to understand how the present situation arose and it is hoped that the contents of this Thesis will add to that understanding.

Appendix 1.1

Schemes for the Young Unemployed

The aim in this appendix is to provide some brief details concerning the state schemes for the young unemployed which were open to school leavers in the time period covered by this Thesis.

In 1977, there were two main schemes open to school leavers, they were The Job Creation Programme and The Work Experience Programme (Metcalf, 1982). The Job Creation Programme was the largest scheme in 1977. It was set up in October 1975 and ended in December 1978. The aim of the scheme was to provide temporary jobs of social value to those aged 16-24 and over 50 who would otherwise be unemployed. The average duration of these temporary jobs was 32 weeks and participants on the schemes were paid the going local market wage for the job. The jobs themselves were usually provided by local authorities and just under half the projects were of an environmental protection or construction-related nature. Just under a half of the people employed on this scheme were aged under 18 (Metcalf, 1982). The Work Experience Programme was introduced in September 1976 and ended in December 1978. It was designed to provide work experience to young people in order to increase their employability. In 1977, however, only a small proportion of all those on schemes were in the Work Experience Programme.

In April 1978, a new scheme The Youth Opportunities Programme (YOP) was created. It replaced both The Work Experience and Job Creation Programmes. It was still the dominant state scheme for unemployed Scottish school leavers in 1982/83. It was completely replaced in September 1983 by The Youth Training Scheme, although the Youth Training Scheme actually began in April 1983. The aims of YOP were to reduce young peoples' unemployment and to increase

their employability by providing them with work experience, i.e. the same aims as The Work Experience Programme from which it developed. The young people who entered the scheme were paid a weekly allowance. When it was first created, those young people who did not have a job at the Easter following leaving school were automatically offered a place on YOP. After Christmas 1981 this condition was changed to all those who did not have job at the Christmas after leaving school. It was also open to other 16 and 17 year olds who had been unemployed for 3 months or more.

YOP schemes fell under the two main headings: work experience and work preparation. Work experience schemes accounted for the bulk of all YOP schemes. By far the largest type of work experience scheme was the work experience on employer's premises (WEEP) scheme. Among the work preparation schemes, the main type of schemes were preparatory courses including short industrial courses. In 1981/82 two thirds of young people on YOP schemes were engaged in work experience on employer's premises (Metcalf, 1982). The employers involved in providing YOP schemes usually operated in service industries (two thirds of employers were in the service industries in 1980/81 (Metcalf, 1982)). Small firms were disproportionately represented among employers participating on YOP schemes. Finally, in terms of the characteristics of young people participating on YOP schemes, a large proportion (70% in 1980/81) were unqualified or possessed qualifications below C.S.E. Grade One. The educational qualifications possessed by YOP participants tended to be better in areas of high unemployment (Greaves, 1984). Finally, the majority of those on YOP, (75% in 1980/81) had never had a job before entering the scheme.

Appendix 1.2

Redundancy Payments and Payments for Unfair Dismissal

The Acts The main pieces of legislation relating to redundancy payments and unfair dismissal payments are The Employment Protection (Consolidation) Act 1978, (which was modified in certain respects by) The Employment Acts of 1980 and 1982.

Who is entitled to Such Payments? Since the second of January 1983, in order to qualify for redundancy payments and compensation for unfair dismissal a worker must have continuously worked for his/her employer for at least two years, where the employer has less than 20 employees, and one year otherwise. The qualifying period of continuous employment is one month when a worker has been suspended for medical reasons.

Continuous Employment A worker's continuous employment is calculated from the date when the worker started with his/her present employer up until the qualification date. The qualification date depends upon the circumstances (See Booklets 13 and 16 listed below for exact details).

A week counts towards a worker's period of continuous employment if he/she worked more than 16 hours in that week, or, if he/she worked for more than 8 hours in the week and he/she had been employed with that employer for more than five years. Absence because of sickness, holidays, temporary lay-offs and pregnancy are all included in the period of continuous employment.

Weeks off because of strikes (after 6.7.64) do not count nor do weeks taken off because of pregnancy, after the 29th week.

The Amount Awarded Workers under the age of 18 receive a basic minimum award if they are unfairly dismissed.

In calculating the amount awarded for redundancy payments (for all workers)

and for the basic unfair dismissal award (for all workers aged 18+) the following rules apply: the award is calculated by adding up the weeks of continuous employment, within the last twenty years only, and awarding:

1. One and a half weeks for each year of complete employment when an employee was between 41 and 65 (60 for women) years old.

2. A week's pay for each complete year of employment when an employee was between 22 and 40.

3. Half a week's pay for each complete year of employment when an employee was below the age of 22.

The maximum number of weeks counted as a result of the above formula is 30. The maximum weekly amount which could be counted, is reviewed annually.
In the case of unfair dismissal, workers may also be awarded a compensatory award on top of of the basic award by an Industrial Tribunal, in order to compensate them for their loss insofar as the employer was responsible for this loss. The maximum compensatory award is reviewed annually. The compensatory award would be adjusted downward to the extent that a worker was judged to be responsible for his own dismissal.

Implications. Three features of the provisions relating to redundancy payments and the basic unfair dismissal awards will tend to make such payments lower for young people:

1. The awards are based on tenure in the current job (which will generally be lower in the case of young people).

2. Under 18 year olds only receive a maximum basic award for unfair dismissal.

3. The value of the award for a year of continuous employment is lower for

the young (see above).

References

Department of Employment, "Employment Acts 1980 and 1982: An Outline". HMSO, PL709, 1982.

Department of Employment, "Rights on Termination of Employment". HMSO, PL707, Booklet 14, 1982.

Department of Employment, "Rules Governing Continuous Employment and A Week's Pay". HMSO, PL711, Booklet 11, 1983.

Department of Employment, "Unfair Dismissal?". HMSO, PL712, Booklet 13, 1st Revision, 1983.

Department of Employment, "Redundancy Payments". HMSO, PL744, Booklet 16, 1984.

Appendix 2.1

Reconciling the SEDA Classifications of Industry of Employment with the Standard Industrial Classifications

The SEDA data contains three extra categories that are not contained within the SIC's. These are: Oil Extraction, Engineering Not Otherwise Specified and Distribution Not Otherwise Specified. The first two are found in the 1977 and 1979 data, and Engineering NOS. and Distribution NOS. are found in the 1981 data. Only Engineering NOS. is found in the 1983 data.

For the 1977 and 1979 data sets, Oil Extraction was included with the figure for Order II (1968 SIC); Mining and Quarrying, of which it actually forms a small part. Similarly, for the 1981 data, Distribution NOS. was included in Class 64/65 - Retail Distribution

Engineering NOS. causes more problems. It was quite a large category (mainly consisting of males) and does not clearly belong to any Order or Class; or group of Orders or Classes. The decision was taken to allocate those in this category amongst Orders VII, VIII, IX and X - Mechanical Engineering; Instrument Engineering; Electrical Engineering and Shipbuilding and Marine Engineering, for the 1977 and 1979 data; and, amongst Classes 32, 34, 36 and 37, Mechanical Engineering; Electrical and Electronic Engineering; Manufacture of Other Transport Equipment; and Instrument Engineering for the 1981 and 1983 data.

The method of allocation was as follows: the total percentage of the sample in the four Orders or Classes was found, each particular Order's or Class's percentage of the sample was then divided by this to produce a weight, and, finally, those weights were used to allocate those in the category Engineering NOS. amongst the Orders and Classes.

Appendix 2.2

Conversion of the 1968 SIC to the 1980 SIC via the Industry Variable

Industrial Category	1968 SIC Orders	1980 SIC Classes
1	1	1,2,3
2	2,4	11,12,13,14
3	21	15,16,17
4	6	21,22
5	16	23,24
6	5	25,26
7	7	32
8	9	33,34
9	10,11,	35,36
10	8,12	31,37
11	3	41,42
12	13	43
13	14,15	44,45
14	17	46
15	18	47
16	19	48,49
17	20	50
18	23	61,62,63,64,65,67
19	26	66,96,97,98,99
20	22	71,72,73,74,75,76, 77,78,79
21	24	81,82,83,84,85
22	27	91,92
23	25	93,94,95

List One: Industry Variable Labels*

1. Agriculture, Forestry and Fishing
2. Mining and Quarrying
3. Gas, Electricity and Water
4. Metal Manufacturing
5. Bricks, Pottery, Glass and Cement etc.
6. Chemicals and Allied Industries
7. Mechanical Engineering
8. Electrical Engineering
9. Shipbuilding, Marine Engineering and Vehicles
10. Instrument Engineering and Metal Goods NES.
11. Food, Drink and Tobacco
12. Textiles
13. Clothing and Footwear; Leather, Leather Goods and Fur
14. Timber, Furniture, etc.
15. Paper, Printing and Publishing
16. Other Manufacturing Industries
17. Construction
18. Distributive Trades
19. Miscellaneous Services
20. Transport and Communication
21. Insurance, Banking, Finance and Business Services
22. Public Administration and Defence
23. Professional and Scientific Services

*Labels based on the titles of the Orders of the 1968 SIC.

Appendix 2.3

The Relationship Between the Broad Industry Groups and the 1968 SIC Orders and the 1986 SIC Classes

Industry Group	1968 SIC Orders	1980 SIC Classes
1. Agriculture, Forestry and Fishing	1	1,2,3
2. Mining and Quarrying	2,4	11 to 14
3. Manufacturing Industries	3,5 to 19	21 to 26 31 to 37 41 to 49
4. Construction	20	50
5. Gas, Electricity Water	21	15 to 17
6. Service Industries	22 to 27	61 to 67 71 to 79 81 to 85 91 to 98

Appendix 2.4

The Approximate Changes in The Industrial Distribution of School Leavers' Employment Caused by The Use of The Department of Employment's (DOE's) Proposed Reconciliation of The 1968 and 1980 SICs

The aim in this appendix is to show the approximate effect, on school leavers' industrial distribution of employment, of the use of the DOE's (1983) proposed reconciliation of the 1968 and 1980 SICs. It will be shown that the proposed reconciliation does not produce a perfect correspondence between the 23 industrial categories consisting of groupings of 1968 SIC Orders and 1980 SIC Classes used in the main text. The results of a computational exercise suggest that the extent of the imperfect correspondence varies between the 23 industrial categories.

The computational exercise involved the following steps:

(i) Allocating an arbitrary number (100) to each of the 27 Orders of the 1968 SIC and then grouping them in the manner suggested by the DOE to produce 23 industrial categories.

(ii) Using a matrix supplied by the Scottish Office to convert the arbitrary numbers from the Orders of the 1968 SIC to the Classes of the 1980 SIC. The resulting figures for employment in each of the 60 Classes of the 1980 SIC were then grouped in the manner suggested by the DOE to produce 23 industrial categories.

(iii) The figures at steps (i) and (ii) were then compared.

The matrices supplied by the Scottish Office relate to all ages' employment in Scotland in 1981. The actual matrices used related to all ages of both genders, full-time and part-time taken together, full-time females only and

full-time males only. Since they relate to all ages and to 1981 the matrices provide only an approximate measure of the changes induced in school leavers' industrial distribution of employment by the DOE's proposed reconciliation.

Table A2.1 shows the results of the computational exercise. The first column shows, for each group, the extent to which the use of the DOE's reconciliation produces a mismatch between the figures produced at steps (i) and (ii). For instance, the second figure in the column relating to both genders shows that the figures calculated at step (ii) underestimate the number in this category by 3.7% of the true figures, calculated at step (i). Particularly badly affected categories include: Mechanical and Electrical Engineering; Instrument Engineering and Metal Goods NES; Textiles; Clothing and Footwear etc; Timber Furniture etc; Distributive Trades; Miscellaneous Services; Public Administration and Defence; and, Professional and Scientific Services.

Although some of the percentages in the first column are rather large they may not have a marked impact on school leavers' industrial distribution of employment, since the effect on school leavers' industrial distribution of employment will depend both on the scale of the mismatches between the figures calculated at steps (i) and (ii) and also on the percentage of school leavers' total employment in the affected industrial categories.

Column two shows, for each group, the original percentage of school leavers' employment in each industrial category in 1979. Column three shows, for each group, the percentages that result when the original percentages are multiplied by the ratio of the figures calculated at steps (ii) and (i). Column four shows the difference between the figures in columns three and two and provides an approximate measure of the impact, on school leavers' industrial distribution of employment in 1979 of the use of DOE's proposed reconciliation.

Table A2.1

The Approximate Extent of Industrial Miscategorisation Caused by Using The Department of Employment's Proposed Reconciliation of the 1968 and 1980 SICs

Industrial Category	Both Genders				Females				Males			
	Proportionate Miscategorisation	Original %'s	Reworked %'s	Changes in Percentages due to Miscategorisation	Proportionate Miscategorisation	Original %'s	Reworked %'s	Changes in Percentages due to Miscategorisation	Proportionate Miscategorisation	Original %'s	Reworked %'s	Changes in Percentages due to Miscategorisation
1. Agriculture, Forestry & Fishing	0.0	1.9	1.9	0.0	0.0	0.3	0.3	0.0	0.0	3.3	3.3	0.0
2. Mining & Quarrying	-3.7	1.2	1.2	0.0	-3.4	0.0	0.0	0.0	-3.6	2.2	2.1	-0.1
3. Gas, Electricity & Water	0.0	1.0	1.0	0.0	0.0	0.6	0.6	0.0	0.0	1.4	1.4	0.0
4. Metal Manufacturing	-2.5	1.0	1.0	0.0	-11.2	0.3	0.3	0.0	-0.9	1.6	1.6	0.0
5. Bricks, Pottery, Glass & Cement	9.3	0.6	0.7	0.1	7.7	0.1	0.1	0.0	9.9	1.0	1.1	0.1
6. Chemicals and Allied Industries	-9.6	1.0	0.9	-0.1	-11.7	0.9	0.8	-0.1	-9.7	1.0	0.9	-0.1
7. Mechanical Engineering	33.9	3.0	4.0	1.0	33.9	0.6	0.8	0.2	34.6	5.2	7.0	1.8
8. Electrical Engineering	15.6	5.3	6.1	0.8	16.5	4.3	5.0	0.7	16.7	6.0	7.0	1.0
9. Shipbuilding, Marine Engineering & Vehicles	-7.5	4.0	3.7	-0.3	-9.1	0.4	0.4	0.0	-7.2	7.4	6.9	-0.5
10. Instrument Engineering & Metal Goods NES	-11.8	1.8	1.6	-0.2	-6.2	2.2	2.1	-0.1	-13.2	1.3	1.1	-0.2
11. Food, Drink & Tobacco	2.5	5.3	5.4	0.1	2.5	6.2	6.4	0.2	3.3	4.6	4.8	0.2
12. Textiles	-5.8	2.3	2.2	-0.1	-6.6	3.5	3.3	-0.2	77.0	1.2	2.1	0.9
13. Clothing & Footwear; Leather, Leather Goods & Fur	4.6	5.2	5.4	0.2	10.5	9.8	10.8	1.0	-38.0	1.1	0.7	-0.4
14. Timber, Furniture etc	-3.8	1.0	1.0	0.0	-14.4	0.4	0.3	-0.1	-2.2	1.6	1.6	0.0
15. Paper, Printing & Publishing	-0.3	2.2	2.2	0.0	-0.1	2.8	2.8	0.0	-0.4	1.7	1.7	0.0
16. Other Manufacturing Industries	1.5	0.8	0.8	0.0	3.0	0.9	0.9	0.0	1.6	0.6	0.6	0.0
17. Construction	-5.1	8.1	7.7	-0.4	-6.1	1.2	1.1	-0.1	-5.1	14.1	13.4	-0.7
18. Distributive Trades	13.0	17.1	19.3	2.2	4.0	23.0	23.9	0.9	34.0	12.0	16.1	4.1
19. Miscellaneous Services	-7.6	11.4	10.5	-0.9	-2.1	10.5	10.3	-0.2	-30.0	12.2	8.5	-3.7
20. Transport & Communication	-1.0	2.9	2.9	0.0	-1.7	1.7	1.7	0.0	-0.6	3.8	3.8	0.0
21. Insurance, Banking, Finance & Business Services	7.6	6.7	7.2	0.5	16.7	10.7	12.5	1.8	21.9	3.3	4.0	0.7
22. Public Administration & Defence	11.2	9.7	10.8	1.1	3.2	8.5	8.8	0.3	3.1	10.7	11.0	0.3
23. Professional & Scientific Services	-22.0	6.5	5.1	-1.4	-20.0	10.9	8.7	-2.2	-28.2	2.6	1.9	-0.7
Total	0.0	100	102.5	/	0.0	99.8	101.9	/	0.0	99.9	102.5	/

The figures in column four are approximate because they are based on a matrix relating to all ages' employment and because the procedure does not preserve the value of the sum of the percentages, i.e. the percentages in column four add up to more than 100%.

Table A2.2 summarises the information contained in Table A2.1 by showing, for both genders taken together and each gender separately, those industrial categories whose share of school leavers' total employment was altered by more than one percentage point in either direction. It can be seen that the problem was worse for males than females and particularly affected the service and engineering industries, with the service industries being the most affected. However, it can be calculated from Table A2.1 that taken over all the service industries the effect netted out to a less than one percentage point increase in their combined share of each group of school leavers' total employment.

The results of the computational exercise indicate that the problems in the categorisation of school leavers' industry of employment produced by the use of the DOE's proposed reconciliation of the 1968 and 1980 SICs will complicate the analysis of the changing industrial distribution of their employment in general and, in particular, that it will complicate the analysis more for males than for females and more for the service and engineering industries than for other industries.

Table A2.2

The Industrial Categories Most Affected by Miscategorisation*

	Both Genders	Females	Males
Percentage Increased	Distributive Trades (2.2%) Mechanical Engineering (1%)	Insurance, Banking, Finance & Business Services (1.8%) Clothing & Footwear etc (1%)	Distributive Trades (4.1%) Mechanical Engineering (1.8%) Electrical Engineering (1%)
Percentage Decreased	Professional and Scientific Services (1.4%)	Professional and Scientific Services (2.2%)	Miscellaneous Services (3.7%)

* The above industrial categories are those which had their original percentage changed by 1 percentage point or more.

Appendix 2.5

The Calculation of the Gini Coefficients

The Gini Coefficients given in the main body of the paper were calculated using the following formula:

$$G=1+(1/n)-(2/n.y)[y +2y +3y + ...+ny]$$

where:

n = the number of industrial categories

y1 = the number of school leavers in the largest industrial category

y2 = the number of school leavers in the second largest industrial category

ny = the number of school leavers in the smallest industrial category

y = the average number of school leavers in an industrial category

This is the statistic reported by Cowell on p.116 of his book "Measuring Inequality" (Cowell, 1977).

Appendix 3.1

The Translation of School Leavers' Recorded Occupations to Warwick Occupational Categories

The aim in this appendix is to explain how the eighteen Warwick Occupational Categories were translated from their original definition in terms of the 223 Occupation Unit Groups of The 1970 Classification of Occupations to their nearest equivalent definition in terms of the 549 Occupation Groups of The 1980 Classification of Occupations.

The translation of the Warwick Occupational Categories from The 1970 Classification of Occupations to The 1980 Classification of Occupations was achieved by using the specimen output supplied with the "Occgroup" computer package developed by Peter Elias, at the Institute for Employment Research, The University of Warwick (Elias, 1982). This package uses the results of a recoding of a 1% subsample of the 1971 Census results for England and Wales, coded according to The 1970 Classification of Occupations, to The 1980 Classification of Occupations by The Office of Population Censuses and Surveys. The resulting cross-classified matrix can be used to convert a set of figures coded according to the 1970 classification to their nearest equivalent 1980 occupation titles. The package itself allows the user to specify any set of groupings of the 1970 occupation titles (up to a maximum of eighteen groupings), which are then translated into the nearest equivalent set of groupings of the 1980 occupation titles. A table is produced to indicate the degree of mismatching between the two groupings.

The actual mechanics of the package are as follows. Firstly, the user specifies which of the 1970 Occupation Unit Groups belong to each of the chosen groupings. Secondly, a matrix showing the percentage of total employment in each of the 549 Occupation Groups, of The 1980 Classification

of Occupations, accounted for by each of the 223 Occupation Unit Groups, of The 1970 Classification of Occupations, is utilised. The package finds the 1970 Occupation Unit Group which accounted for the largest proportion of total employment in each of the 549 Occupation Groups, and then allocates each 1980 Occupation Group to the same grouping as the 1970 Occupation Unit Group that accounted for the largest proportion of its employment. This process is performed for males and females separately. Finally, a printout is produced, for each gender, showing all the 1980 Occupation Groups and which grouping they have been allocated to.

For the analysis of Scottish school leavers' occupational distribution of employment, the results classified by using this package have a number of potential limitations. Firstly, the cross-classified matrix the package uses is now 16 years out of date. Secondly, the cross-classified matrix refers to England and Wales. Thirdly, the cross-classified matrix refers to all ages' employment, not school leavers'. These considerations suggest that the WOC's produced according to The 1980 Classification of Occupations may not be fully consistent with those classified according to The 1970 Classification of Occupations. Since there is no alternative procedure, this problem will have to be lived with.

Appendix 3.2

Measures of the Gender Segregation of School Leavers' Occupational Distributions of Employment

The aim in this appendix is to briefly outline and discuss the various measures of gender segregation utilised in Chapter Three. This discussion is not intended to be a fully comprehensive discussion of such measures; see Hakim (1979), (1981) for further references.

The first two measures to be discussed are both based upon the absolute differential between the percentage of each gender's total employment found in each occupational category. These measures are the index of dis-similarity and the Duncan-Duncan index of segregation (Duncan and Duncan, 1955).

The index of dis-similarity is defined as:

(1) $ID = 1/n \sum_{i=1}^{n} |mit - fit|$

where:

n = the number of occupational categories

mit = the percentage of male school leavers' total employment in occupational category i at time t

fit = the percentage of female school leavers' total employment in occupational category i at time t

This index has a range from zero to (200/n) (since the maximum possible sum of absolute values is 200), i.e. 11.1 in the present case of eighteen occupational categories. A value of zero indicates no segregation and a value of (11.1) indicates complete segregation.

The second measure, the Duncan-Duncan index of segregation, is in fact equal to (n/2) times the index of dis-similarity, and is, a Gini coefficient. The Duncan-Duncan index is defined as:

(2) $DD = 1/2\Sigma_{i=1}^{n} |mit - fit|$

This has a range from zero to 100. A value of zero indicates no segregation and a value of 100 indicates complete segregation. A disadvantage of this, and the preceding index, is that, by themselves, they give no indication of what it is that causes them to change in value.

Blau and Hendricks (1979) have shown that changes in the Duncan-Duncan index can be decomposed into three parts:

1. That part due to the change in the relative shares of school leavers' total employment accounted for by each of the occupational categories wherein one gender had a greater share of school leavers' employment than of school leavers' total employment.

2. The change in the gender composition of school leavers' employment in each occupational category.

3. The interaction of (1) and (2).

Blau and Hendricks (1979) show that the change in the Duncan-Duncan index between any two periods can be written as:

(3) $$DD_t - DD_{t-1} = 1/2 \left[\sum_{i=1}^{n} \left| \frac{q_{it-1} \cdot T_{it}}{\sum_{i=1}^{n} q_{it-1} \cdot T_{it}} - \frac{p_{it-1} \cdot T_{it}}{\sum_{i=1}^{n} p_{it-1} \cdot T_{it}} \right| - DD_{t-1} \right]$$

$$+ 1/2 \left[\sum_{i=1}^{n} \left| \frac{q_{it} \cdot T_{it}}{\sum_{i=1}^{n} q_{it} \cdot T_{it-1}} - \frac{p_{it} \cdot T_{it-1}}{\sum_{i=1}^{n} p_{it} \cdot T_{it-1}} \right| - DD_{t-1} \right]$$

$$+ \text{interaction term}$$

where:

qit = Female school leavers' share of total school leavers' employment in occupational category i in year t.

pit = Male school leavers' share of total school leavers' employment in occupational category i in year t.

tit = Total school leavers' employment in occupational category i in year t

The first term of (3) shows that part of the change in the Duncan-Duncan index which is due to the change in occupational category's shares of school leavers' total employment ie the "mix effect". The second term shows that part of the change in the Duncan-Duncan index which is due to the change in the gender composition of school leavers' employment in each occupational category, i.e. the "composition effect". The third term captures the interaction between the mix and composition effects.

The decomposition described above can be performed either using the base or latter year's occcupational distribution of school leavers' employment and gender composition of employment within each occupational category. The results will be slightly different depending on which year is chosen; this is another version of the well known "index number problem". Following Blau and Hendricks (1979) it was decided to use the information from the base year (since this accords with the direction of time) for the analysis reported in the main text.

Two measures which attempt to describe changes in the occupational pattern of gender segregation are those proposed by Hakim (1979). The first is a measure of females'/males' over-representation in own-gender dominated occupations. This is defined as (in the case of females):

(4) $H1 = \Sigma_{i=1}^{n} fit / \Sigma_{i=1}^{n} Tit$

V_i where: $fit/Tit > \Sigma_{i=1}^{n} fit/\Sigma_{i=1}^{n} Tit$

The second measure is one of females'/males' under-representation in occupations dominated by the other gender. This is defined as (again in the case of females):

(5) $H2 = \Sigma_{i=1}^{n} fit/\Sigma_{i=1}^{n} Tit$

V_i where: $fit/Tit < \Sigma_{i=1}^{n} fit/\Sigma_{i=1}^{n} Tit$

The difference between the measures of over-representation and under-respresenation was proposed as a measure of horizontal gender segregation by Hakim (1981). Hakim's measures have the advantage that they allow one to describe the overall occupational pattern of gender segregation in a succinct manner.

Another measure of gender segregation utilised in the main text is a measure due to Theil (1972). This measure is a measure of the extent to which gender segregation within occupational categories differs from the gender split of school leavers' total employment. The measure is defined as:

(6) $(H - Ho)/H$

where: $H_o = \Sigma_{i=1}^{n} wj.[p_j \log_2(1/p_j) + (1-p_j)\log_2(1/1-p_j)]$

$H = P.\log_2(1/P) + (1-P)\log_2(1/1-P)$

p_j = Female school leavers' share of school leavers' employment in occupational category j

w_j = The proportion of school leavers' total employment in occupational category j

P = Female school leavers' share of school leavers' total employment

This measure compares the difference between a weighted average measure of gender segregation within occupational categories and a measure of the gender split of school leavers' total employment. Theil (1972) proves that the weighted average measure of gender segregation can never be greater

than the measure of the gender segregation of school leavers' total employment. One can use the difference between the two measures divided by the measure relating to the gender split of school leavers' total employment as a measure of gender segregation. It will take a value of zero, if school leavers' employment within each occupational category was divided in the same way as school leavers' total employment, and, it will take a value of one, if there was complete gender segregation within each occupational category.

Using the measures described above it should be possible to determine:

1. Whether the gender segregation of male and female school leaver's occupational distributions of employment changed over time

2. Whether such changes were due to changes in the occupational distribution of school leavers' employment or to changes in the gender composition of employment within occupations (or the interaction of the two).

3. Whether female/male school leavers' employment was increasingly or decreasingly to be found in own gender dominated occupational categories and whether female/male school leavers were increasing their employment in occupational categories dominated by the other gender.

Appendix 4.1

The aim in this appendix is to explain how the changes in school leavers' occupational distribution of employment can be decomposed into three parts according to their proximate cause. The easiest way in which to describe the mechanics of the method is in conjunction with Tables A4.1 and A4.2, which show the various stages in the method for all (i.e., both genders) school leavers. Tables A4.1 and A4.2 are based on the tables in Appendix B - Parts One and Two, in Singelmann and Browning (1980).

The first column of Table A4.1 shows the reconstructed figures for school leavers' employment in each of the eighteen WOC's, in 1977. The second column shows the equivalent figures for 1983. The third column shows the figures that result when school leavers' 1983 employment total is multiplied by the share of school leavers' total employment each WOC held in 1977. In other words, it shows how many school leavers would have been found in each WOC in 1983 if the share of school leavers' total employment accounted for by each WOC had not changed, i.e. if the occupational distribution of school leavers' employment had not changed and only their employment total had. The fourth column of Table A4.1 shows, the figures that result when the reconstructed figures pertaining to the 1983 industrial distribution of school leavers' employment are multiplied by the 1977 occupation by industry matrix. The occupation by industry matrix shows the percentage of school leavers' employment within each industry accounted for by each occupational category. In other words, the fourth column of Table A4.1 shows how many school leavers would have been found in each WOC if the occupational composition of each industry's employment had remained unchanged and only the shares of school leavers' total employment held by each industry had changed. The fifth column of Table A4.1 shows, for each WOC, the actual change in the number of

Table A4.1

Both Sexes

	Numbers Employed (1)	(2)	1983 Total Weighted by 1977 Occ Dist (3)	1983 Total Weighted by 1977 Occ Dist within 25 Industries (4)	Actual Change 1977-83 (2)-(1) (5)	Expected Change 1977-83 (3)-(1) (6)	Net Shift (5)-(6) (7)	Industry Shift Effect (4)-(3) (8)	Occupation Shift and Interaction Effects (2)-(4) (9)
1	714	157	377	456	-557	-337	-220	+79	-299
2	59	31	31	32	-28	-28	0	+1	-1
3	1487	1730	786	974	+243	-701	+944	+188	+756
4	119	63	63	96	-56	-56	0	+33	-33
5	416	252	220	191	-164	-196	+32	-29	+61
6	178	220	94	105	+42	-84	+126	+11	+115
7	1666	377	880	961	-1289	-786	-503	+81	-584
8	12493	7989	6598	7798	-4504	-5895	+1391	+1200	+191
9	5532	2925	2922	3184	-2607	-2610	+3	+262	-259
10	0	0	0	6	0	0	0	+6	-6
11	8983	4749	4745	4312	-4234	-4238	+4	-433	+437
12	3034	2328	1602	2148	-706	-1432	+726	+546	+180
13	6008	1510	3174	1776	-4498	-2834	-1664	-1398	-266
14	2558	912	1351	1104	-1646	-1207	-439	-247	-192
15	9518	4812	5027	4896	-4706	-4491	-215	-131	-84
16	1666	818	880	1110	-848	-786	-62	+230	-292
17	3688	2202	1948	1565	-1486	-1740	+254	-383	+637
18	1368	346	723	695	-1022	-645	-377	-28	-349
Total									
	59487	31421	31421	31409	-28066	-28066	0	-12	+12

Table A4.2

Both Sexes

	Numbers Employed		1983 Total Weighted by 1977 Occ Dist	1983 Total Weighted by 1977 Ind Dist	Actual Change 1977-83 (2)-(1)	Expected Change 1977-83 (3)-(1)	Net Shift (5)-(6)	Occupation Shift Effect (4)-(3)	Industry Shift and Interaction Effects (2)-(4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	714	157	377	144	-557	-337	-220	-233	+13
2	59	31	31	15	-28	-28	0	-16	+16
3	1487	1730	786	1385	+243	-701	+944	+599	+345
4	119	63	63	36	-56	-56	0	-27	+27
5	416	252	220	303	-164	-196	+32	+83	-51
6	178	220	94	154	+42	-84	+126	+60	+66
7	1666	377	880	403	-1289	-786	-503	-477	-26
8	12493	7989	6598	7091	-4504	-5895	+1391	+493	+898
9	5532	2925	2922	2655	-2607	-2610	+3	-267	+270
10	0	0	0	0	0	0	0	0	0
11	8983	4749	4745	4772	-4232	-4238	+4	+27	-23
12	3034	2328	1602	1442	-706	-1432	+726	-160	+886
13	6008	1510	3174	2754	-4498	-2834	-1664	-420	-1244
14	2558	912	1351	1280	-1646	-1207	-439	-71	-368
15	9518	4812	5027	5234	-4706	-4491	-215	+207	-422
16	1666	818	880	643	-848	-786	-62	-237	+175
17	3688	2202	1948	2817	-1486	-1740	+254	+869	-615
18	1368	346	723	296	-1022	-645	-377	-427	+50
Total	59487	31421	31421	31424	-28066	-28066	0	+3	-3

school leavers in each occupational category, i.e. the entries in column two minus the entries in column one. The sixth column shows, for each WOC, the change that would have been expected to occur if the occupational distribution of school leavers' employment had not changed between 1977 and 1983, i.e. the entries in column three minus those in column one. The seventh column shows the "net shift" for each WOC over the period 1977–1983.

The net shift, for each WOC, shows the difference between the actual and expected changes in the number of school leavers,i.e. the entries in column five minus those in column six. That is, it shows that part of the actual change in school leavers' employment in each WOC due to the change in that WOC's share of school leavers' total employment. It is this net shift which is decomposed into the industry shift effect, the occupational composition shift effect and the interaction effect.

The eighth column shows the industry shift effect for each WOC. This is calculated by deducting the entries in column three from those in column four. The resulting figures show the change in school leavers' employment in each WOC that would have occurred over the period 1977–83 if the share of individual industries in school leavers' total employment had changed but the occupational composition of school leavers' employment within each industry had remained unchanged. The ninth column shows the remaining part of each WOC's net shift. This remaining part is equal to the occupational composition shift effect and the interaction effect combined.

The first seven columns of Table A4.2 are the same as their counterparts in Table A4.1, with the exception of column four. In the case of Table A4.2, column four shows, for each WOC, the figures that result when the figures for school leavers' employment in each industry in 1983 are calculated by

multiplying school leavers' employment total in 1983 by the shares of each industrial category in school leavers' total employment in 1977, and these figures are then multiplied by school leavers' 1983 occupation by industry matrix and, finally, the entries in the resulting matrix are summed across industries. In other words, it shows how many school leavers would have been found in each WOC if the shares of school leavers' total employment held by each industry had remained unchanged and only the occupational composition of each industry's employment had changed.

The eighth column of Table A4.2 shows the occupational composition shift effect for each WOC. This is calculated by deducting the entries in column three from those in column four. The resulting figures show by how much school leavers' employment in each WOC would have changed, over the period 1977–83, if the share of individual industries in school leavers' total employment had not changed, and only the shares of each industry's employment accounted for by the eighteen WOC's had changed, i.e. only the occupational composition of school leavers' employment within each industry had changed.

The ninth column shows the remaining part of each WOC's net shift. This remaining part is equal to the industry shift and interaction effect combined. The final two columns of Table A4.2 show the percentage of each WOC's net shift due to the occupational composition shift effect and combined industry shift and interaction effects, respectively.

Finally, the interaction effect is calculated by deducting the combined figures for the industry and occupational composition shift effects from the net shift figures, for each WOC.

Tables A4.3 and A4.4 are the equivalents of Tables A4.1 and A4.2, this time

Table A4.3

Female School Leavers

	Numbers 1977 (1)	Employed 1983 (2)	1983 Total Weighted by 1977 Occ Dist (3)	1983 Total Weighted by 1977 Occ Dist within 25 Industries (4)	Actual Change 1977-83 (2)-(1) (5)	Expected Change 1977-83 (3)-(1) (6)	Net Shift (5)-(6) (7)	Industry Shift Effect (4)-(3) (8)	Occupation Shift and Interaction Effects (2)-(4) (9)
1	248	43	129	156	-205	-119	-86	+27	-113
2	0	14	0	5	+14	0	+14	+5	+9
3	1325	1565	688	997	+240	-637	+877	+309	+568
4	28	43	14	16	+15	-14	+29	+2	+27
5	193	57	100	108	-136	-93	-43	+8	-51
6	0	72	0	0	+72	0	+72	0	+72
7	276	144	143	201	-132	-133	+1	+58	-57
8	10130	6244	5264	6238	-3886	-4866	+980	+974	+6
9	4113	1955	2137	2206	-2158	-1976	-182	+69	-251
10	0	0	0	0	0	0	0	0	0
11	248	115	129	79	-133	-119	-14	-50	+36
12	55	14	29	39	-41	-26	-15	+10	-25
13	4417	1048	2295	1412	-3369	-2122	-1247	-883	-364
14	386	230	201	132	-156	-185	+29	-69	+ 98
15	2954	1048	1535	1097	-1906	-1419	-487	-438	-49
16	193	57	100	140	-136	-93	-43	+40	-83
17	2788	1651	1447	1427	-1137	-1341	+204	-20	+224
18	248	43	129	86	-205	-119	-86	-43	-43
Total	27602	14343	14340	14339	-13259	-13262	+3	-1	+4

Table A4.4

Female School Leavers

	Numbers Employed 1977 (1)	1983 (2)	1983 Total Weighted by 1977 Occ Dist (3)	1983 Total Weighted by 1977 Ind Dist (4)	Actual Change 1977-83 (2)-(1) (5)	Expected Change 1977-83 (3)-(1) (6)	Net Shift (5)-(6) (7)	Occupation Shift Effect (4)-(3) (8)	Industry Shift and Interaction Effects (2)-(4) (9)
1	248	43	129	31	-205	-119	-86	-98	+12
2	0	14	0	13	+14	0	+14	+13	+1
3	1325	1565	688	1099	+240	-637	+877	+411	+466
4	28	43	14	24	+15	-14	+29	+10	+19
5	193	57	100	136	-136	-93	-43	+36	-79
6	0	72	0	59	+72	0	+72	+59	+13
7	276	144	143	160	-132	-133	+1	+17	-16
8	10130	6244	5264	5443	-3886	-4866	+980	+179	+801
9	4113	1955	2137	1916	-2158	-1976	-182	-221	+39
10	0	0	0	0	0	0	0	0	0
11	248	115	129	147	-133	-119	-14	+18	-32
12	55	14	29	20	-41	-26	-15	-9	-6
13	4417	1048	2295	1758	-3369	-2122	-1247	-537	-710
14	386	230	201	371	-156	-185	+29	+170	-141
15	2954	1048	1535	1414	-1906	-1419	-487	-121	-366
16	193	57	100	37	-136	-93	-43	-63	+20
17	2788	1651	1447	1675	-1137	-1341	+204	+228	-24
18	248	43	129	37	-205	-119	-86	-92	+6
Total	27602	14343	14340	14340	-13259	-13262	+3	0	+3

for female school leavers. Tables A4.5 and A4.6 are male school leavers' equivalents of Tables A4.1 and A4.2.

Table A4.5

Males

	Numbers Employed 1977 (1)	1983 (2)	1983 Total Weighted by 1977 Occ Dist (3)	1983 Total Weighted by 1977 Occ Dist within 25 Industries (4)	Actual Change 1977-83 (2)-(1) (5)	Expected Change 1977-83 (3)-(1) (6)	Net Shift (5)-(6) (7)	Industry Shift Effect (4)-(3) (8)	Occupation Shift and Interaction Effects (2)-(4) (9)
1	480	120	258	318	-360	-222	-138	+60	-198
2	64	0	26	31	-64	-38	-26	+5	-31
3	128	154	77	54	+26	-51	+77	-23	+100
4	128	17	63	76	-111	-65	-46	+13	-59
5	224	205	113	84	-19	-111	+92	-29	+121
6	160	137	92	93	-23	-68	+45	+1	+44
7	1407	239	748	697	-1168	-659	-509	-51	-458
8	2334	1744	1245	1518	-590	-1084	+499	+273	+226
9	1439	923	765	892	-516	-674	+158	+127	+31
10	10	0	5	5	-10	-5	-5	0	-5
11	8761	4651	4686	4206	-4110	-4075	-35	-480	+445
12	2974	2326	1595	2110	-648	-1379	+731	+515	+216
13	1631	445	866	370	-1186	-765	-421	-496	+75
14	2174	684	1163	1070	-1490	-1011	-479	-93	-386
15	6587	3779	3515	3742	-2808	-3072	+264	+227	+37
16	1439	769	776	390	-670	-663	-7	+154	-161
17	895	564	485	292	-331	-410	+79	-193	+272
18	1119	325	603	595	-794	-516	-278	-8	-270
Total	31954	17082	17081	17083	-14872	-14873	+1	+2	-1

Table A4.6

Males

	Numbers Employed 1977 (1)	1983 (2)	1983 Total Weighted by 1977 Occ Dist (3)	1983 Total Weighted by 1977 Ind Dist (4)	Actual Change 1977-83 (2)-(1) (5)	Expected Change 1977-83 (3)-(1) (6)	Net Shift (5)-(6) (7)	Occupation Shift Effect (4)-(3) (8)	Industry Shift and Interaction Effects (2)-(4) (9)
1	480	120	258	102	-360	-222	-138	-156	+18
2	64	0	26	0	-64	-38	-26	-26	0
3	128	154	77	213	+26	-51	+77	+136	-59
4	128	17	63	12	-111	-65	-46	-51	+5
5	224	205	113	292	-19	-111	+92	+179	-87
6	160	137	92	101	-23	-68	+45	+9	+36
7	1407	239	748	253	-1168	-659	-509	-495	-14
8	2334	1744	1245	1582	-590	-1089	+499	+337	+162
9	1439	923	765	781	-516	-674	+158	+16	+142
10	10	0	5	0	-10	-5	-5	-5	0
11	8761	4651	4686	4666	-4110	-4075	-35	-20	-15
12	2974	2326	1595	1401	-648	-1379	+731	-194	+925
13	1631	445	866	1036	-1186	-765	-421	+170	-591
14	2174	684	1163	814	-1490	-1011	-479	-349	-130
15	6587	3779	3515	3868	-2808	-3072	+264	+353	-89
16	1439	769	776	649	-670	-663	-7	-127	+120
17	895	564	485	1071	-331	-410	+79	+586	-507
18	1119	325	603	242	-794	-516	-278	-361	+83
Total	31954	17082	17081	17083	-14872	-14873	+1	+2	-1

Appendix 4.2

The Relationship Between The Five Occupation Groups and The Eighteen Warwick Occupational Categories

No.	Title	Pre-1985 Warwick Occupational Categories
1.	White Collar Occupations	(1) Managers and administrators
		(2) Education professions
		(3) Health professions etc
		(4) Other professions
		(5) Literary, artistic and sports occupations
		(6) Engineers, scientists etc
		(7) Technicians, draughtsmen
		(8) Clerical occupations etc
2.	Sales Occupations	(9) Sales occupations
3.	Skilled Manual Occupations	(10) Supervisors, foremen
		(11) Engineering craftsmen
4.	Intermediate Manual Occupations	(12) Other transferable craftsmen
		(13) Non-transferable craftsmen
		(14) Skilled operatives
5.	Unskilled Manual Occupations	(15) Other operatives
		(16) Security occupations
		(17) Personal service occupations
		(18) Other occupations

Appendix Table 5.1

All Ages employment full-time and part-time
in Scotland, 1977 and 1981

Industrial Category	1977				1981			
	Males		Females		Males		Females	
	F/T	P/T	F/T	P/T	F/T	P/T	F/T	P/T
1. Agriculture, Forestry and Fishing	37839	3703	4142	2948	34963	3492	3537	2490
2. Mining and Quarrying	37021	110	1539	345	43493	95	2949	402
3. Gas, Electricity and Water	22635	46	4669	1051	23471	58	4481	1109
4. Metal Manufacturing	35500	202	3251	747	24673	126	2137	346
5. Bricks, Pottery, Glass and Cement etc	14828	133	1853	505	10847	123	1379	412
6. Chemicals and Allied Industries	23369	89	6718	1152	20332	170	5619	799
7. Mechanical Engineering	76125	377	10126	1636	56438	371	6390	1181
8. Electrical Engineering	28618	277	18014	3473	28267	203	14979	1474
9. Shipbuilding, Marine Engineering and Vehicles	68434	153	4704	849	56864	141	4323	805
10. Instrument Engineering and Metal Goods, NES	29854	590	11941	2039	24163	327	8734	1263
11. Food, Drink and Tobacco	49943	1360	31994	8347	47475	1113	26766	6975
12. Textiles	25272	971	27482	5248	17429	848	19322	3464
13. Clothing and Footwear, Leather, Leather Goods and Fur	5823	282	26607	2574	4698	180	20572	2177
14. Timber, Furniture, etc	16825	317	2565	730	14615	353	2089	824
15. Paper, Printing and Publishing	27775	483	13583	2136	25094	504	11493	2215
16. Other Manufacturing Industries	10686	140	4355	785	6885	89	3460	453
17. Construction	150552	1080	8130	3943	132584	1277	8904	4403
18. Distributive Trades	81336	9969	78113	69338	83291	11982	72983	73627
19. Miscellaneous Services	73594	19329	65476	75812	76159	21218	71792	93000
20. Transport and Communication	106725	2379	19702	4784	102261	2305	18015	4489
21. Insurance, Banking, Finance and Business Services	34479	1740	31406	10571	37691	2671	33965	16948
22. Public Administration and Defence	89913	4162	38197	13611	85012	5235	36776	9553
23. Professional and Scientific Services	94779	8348	146537	99067	101793	6796	153806	109597
TOTAL	1141925	56240	561104	311691	1058498	59677	534471	338006
	TOTAL ALL EMPLOYEES			2070960	TOTAL ALL EMPLOYEES			1990652

Sources:

Scottish Office derived from: Census of Employment June 1977 and September 1981

Appendix 5.1

The figures relating to the industrial distribution of all ages' employment in 1979 and 1983 were taken from Table 9.3(a), Scottish Abstract of Statistics, No. 13, 1984, pp.57-8. The figures for 1983 as they stood, only distinguished between industries in a sufficiently detailed manner to allow a thirteen way common classification between them and the figures for school leavers based on the previously used 23 way classification. In order to create the fourteenth category the figures for all ages' employment in the Coal and Petroleum Products industries had to be reallocated from the Chemicals and Allied Industries and Coal and Petroleum Products category to the Mining and Quarrying category. This was achieved in the following way. It was assumed that the Coal and Petroleum Products industries made up the same proportion of the combined Chemicals and Allied Industries plus Coal and Petroleum Products Industries' employment in 1983 as they had in 1981. The figures for 1983 were then multiplied by this proportion and the result allocated to the Mining and Quarrying industry to produce the category Mining, Quarrying; Coal and Petroleum Products.

The relationship between the new industrial classification, the previous industrial classification and the 1968 and 1980 SIC's is given below.

The Relationships Between the Fourteen-Way Industrial Classification and the Twenty-Three-Way Industrial Classification and the 1968 and 1980 Standard Industrial Classifications

New Category	Previous Category	1968 SIC Orders	1968 SIC Classes
1	1	1	1-3
2	2	2, 4	11-14
3	6	5	25,26
4	11	3	41, 42
5	4	6	22
6	7-10	7-12	32-36
7	12, 13	13-15	43, 45
8	5, 14-16	16-19	24, 46-49
9	17	20	50
10	3	21	16, 17
11	20	22	71-79
12	18	23	61-65, 67
13	19, 21, 23	24-26	66, 81-84, 93-99
14	22	27	91-92

The titles of the fourteen industrial categories are given below:

Industrial Category	Title*
1	Agriculture, Forestry and Fishing
2	Mining, Quarrying; Coal and Petroleum Products
3	Chemicals and Allied Industries
4	Food, Drink and Tobacco
5	Metal Manufacture
6	Engineering; Vehicles; Shipbuilding and Metal Goods NES
7	Textiles; Leather, Clothing and Footwear
8	Bricks, Pottery etc.; Timber, Furniture etc.; Paper, Printing and Publishing, and Other Manufacturing Industries
9	Construction
10	Gas, Electricity and Water
11	Transport and Communication
12	Distributive Trades
13	Insurance, Banking, Finance and Business Services; Professional and Scientific Services; and Miscellaneous Services
14	Public Administration and Defence

* Titles based on titles of 1968 SIC Orders.

Technical Appendix 5.1

1. The national component and the combined structural and differential components together sum to the actual change in school leavers' employment.

   This is trivial. It can be seen from equation (5.2), in the main text, that the first part of the first term on the right hand side, and, the second part of the second term, cancel out to leave the actual change in school leavers' employment.

2. The combined structural and differential component is comprised of that part due to the change in recruitment ratios and that part due to the change in industry's shares of all ages' total employment.

   Rewrite the two components of the combined structural and differential component as (multiplying out brackets):

   (i) $\Sigma_{i=1}^{n}$ **[(rit−1.pit.Nt)−(rit−1.pit−1.Nt)+(rit.pit.Nt)−(rit−1.pit.Nt)]**

   the terms at either end of (i) cancel out to leave:

   (ii) $\Sigma_{i=1}^{n}$ **[(rit.pt.Nt) − (rit−1.pit−1.Nt)]**

   Substituting (Nt/Nt−1).Nt−1 for Nt, and noting that (rit.pit.Nt) equals Sit, and, that (rit−1.pit−1.Nt−1) equals Sit−1 yields:

   (iii) $\Sigma_{i=1}^{n}$ **[Sit − (Nt/Nt−1) . Sit−1]**

   (iii) is, of course, the combined structural and differential component.

Appendix 6.1

Scottish Certificate of Education Attainment

Overall attainment in SCE examinations

1 No awards in any SCE examination

2 O grade: D or E award(s) only

3 1 O grade at A to C, no Highers

4 2 O grades

5 3 O grades

6 4 O grades

7 5 O grades

8 6 or more O grades at A to C, no Highers

9 1 Higher pass

10 2 Highers

11 3 Highers

12 4 Highers

13 5 Highers

14 6 or more Highers

Appendix 7.1

The Problems in Modelling Staying-On Behaviour Using the SEDA

It is not possible to examine the changes in Scottish school leavers' staying-on behaviour using the SEDA data set for the 1979, 1981 and 1983 SSLS's. The two main reasons why Scottish school leavers' staying-on behaviour cannot be examined are: firstly, that the SEDA data set does not contain a proper age/stage cohort, and, secondly, because of the lack of a control group for those young people who left school at the end of their fifth form.

Turning to the lack of a proper age/stage cohort, the problem with the SEDA data set is that it relates to a group standardised according to the time at which they left school rather than to a group standardised according to their age or stage in the educational process. Figures A7.1 and A7.2 show the difference between an age/stage cohort and the SSLS design. The double vertical lines in the figures show the point at which young people left school. In order to use the SEDA data set to examine the determinants of young people's staying-on decisions it would be necessary to assume that young people's staying-on decisions were stable over time; since school leavers would have made their staying-on decisions at different points in time, depending upon which form they left school from. More importantly, it would also be necessary to assume that no time-dependent variables had been omitted from the estimating equation. Perhaps the most important omitted time-dependent variable would be a measure of school leaver's employment prospects.

Figure A7.3 illustrates the second problem mentioned above, namely, that of a lack of a control group for fifth form leavers. In Figure A7.3 the temporal

Figure A7.1 Age/stage cohort*

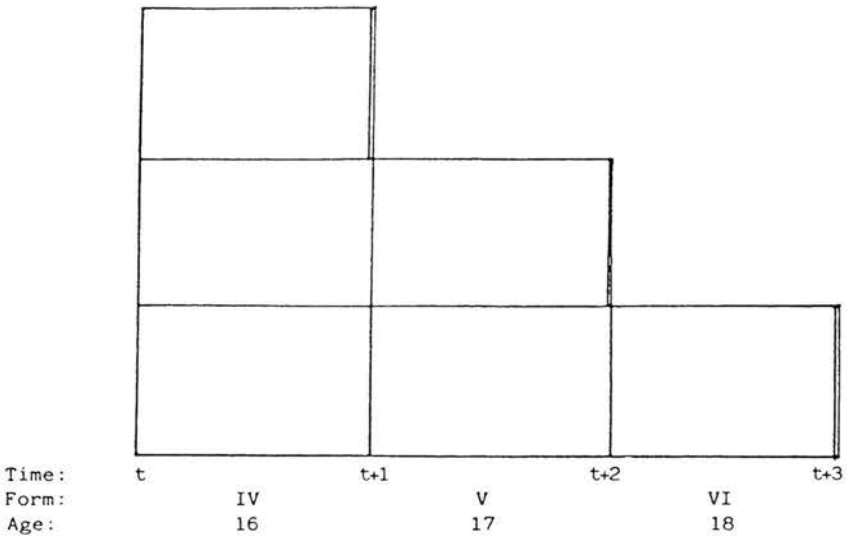
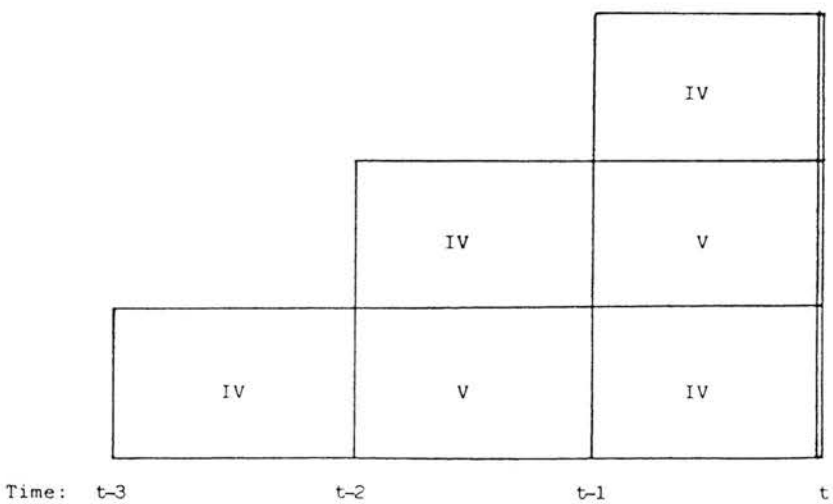
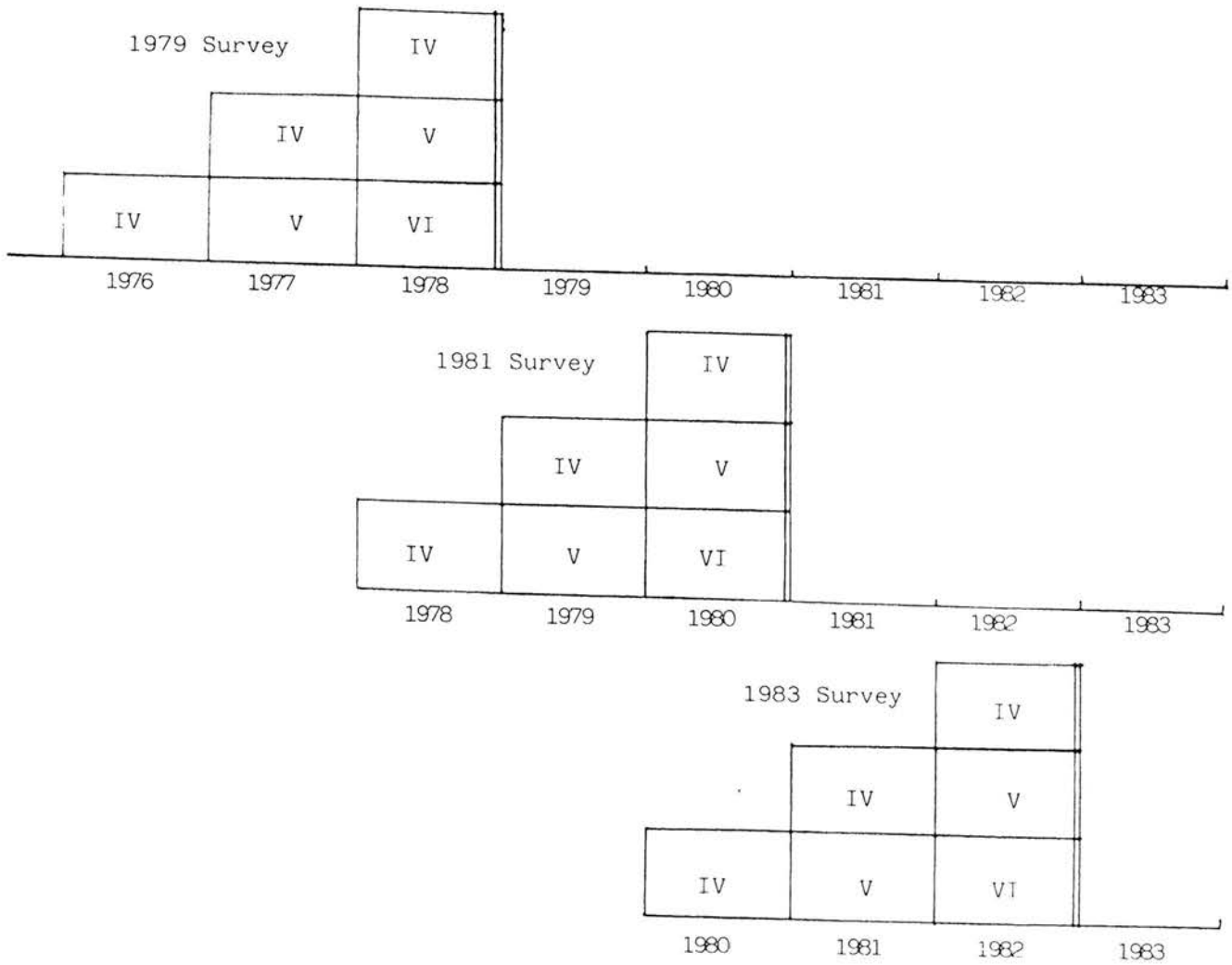


Figure A7.2 SSLS design



* The roman numerals relate to school form.

Figure A7.3


1979 Survey
IV
IV
V
IV
V
VI
1976
1977
1978
1979
1980
1981
1982
1983
1981 Survey
IV
IV
V
IV
V
VI
1978
1979
1980
1981
1982
1983
1983 Survey
IV
IV
V
IV
V
VI
1980
1981
1982
1983

relationship between the 1979, 1981 and 1983 surveys is shown. It can be seen from the figure that the young people in the 1981 and 1983 surveys, who left school at the end of the sixth form, made their decision whether to stay-on into a fifth form or not at approximately the same time as the fourth form leavers in the 1979 and 1981 surveys, respectively, made their decision whether to stay-on or not. Given the assumptions about time invariance discussed above, it may appear that it is possible to group the fourth and sixth form leavers from adjacent surveys and estimate a staying-on equation. The problem is that, as can be seen from Figure A7.3, it would not be possible to incorporate those who left in the fifth form into such a quasi-cohort.

This is a fundamental problem since those young people who continue into the fifth form and then leave at the end of the fifth form appear to differ significantly from those who continue into a sixth form. The majority (60 per cent in 1981 (McPherson, 1984a)) of those pupils who stay-on into the fifth form do so with the intention of studying for Highers. A quite large minority of pupils stay-on into their fifth form in order to take extra O Grades or re-take previously attempted O Grades. It may well be that it is this latter group which displays the greatest sensitivity in its staying-on rate with respect to changes in youth unemployment. The majority of those who stay on into their fifth year leave at the end of that year (56 per cent in 1981 (McPherson 1984a)). Those that stay on at the end of their fifth form usually do so with the intention of augmenting the number and quality of their Highers in order to increase their chances of gaining a place in further or higher education. During the sixth form, pupils can take the Sixth Year's Study course which is designed as a preparation for higher education.

These differences between fourth and sixth form leavers will mean that an estimating equation which uses data relating to fourth and sixth form leavers

only will be fundamentally mis-specified, since it will conflate two decision processes: that of deciding whether to stay-on in order to get educational qualifications to improve their short-term employment prospects, i.e. the decision process relevant to a large number of young people staying on only for their fifth form, and that of deciding whether to stay-on or not in order to get the qualifications necessary for entrance to a course in further or higher education, i.e. the decision process relevant to the vast majority of young people staying-on into their sixth form.

Appendix 7.2

The Willis-Rosen Model

Willis and Rosen (1979) contend that the probability of an individual attending college depends upon the earnings that that individual would have obtained if they had attended college relative to the earnings they would have obtained if they had not attended college, and, those family background characteristics which influence their discount rates.

In order to estimate their model it was, of course, necessary for Willis and Rosen to have information relating to both what individuals would have earned if they had not gone to college and what they would have earned if they had gone to college. The problem is that only one set of earnings is observed for each individual, depending upon whether they went to college or not. One could regress college attenders' and non-attenders' earnings on a set of personal descriptors and then use the estimated coefficients to impute the missing earnings information, but, as Willis and Rosen (1979) point out, such a procedure could possibly lead to misleading results, due to possible sample selection bias associated with unobserved differences in talent, and hence earnings potential.

For instance, if individuals who attended college had unobserved talents which meant that they could earn more in jobs typically filled by graduates than those individuals who did not attend college could have earned if they had attended college and then held the same jobs then using graduates' observed earnings to impute the earnings individuals who did not go to college would have obtained had they gone to college will produce imputed earnings that are biased upwards. Similarly, if individuals who did not attend college had unobserved talents which meant that they could earn more in jobs typically

filled by non-graduates than graduates could have earned in the same jobs then the imputed wage for graduates had they not attended college would also be biased upwards. The problem is, then, that self-selection into educational classes upon the basis of unobserved talents which provide individuals with a comparative advantage in jobs typically filled by individuals from their educational class will lead to imputed wages, based upon actual earnings observations, being biased upwards. Willis and Rosen (1979) attempted to deal with this problem of self-selection via a two stage procedure.

Firstly, they estimate a reduced form probit equation which includes all observed talent and family background descriptors. Then, the fitted index values from this reduced form probit equation are used to calculate a variable which can be included in the earnings regressions in order to eliminate the effects of self-selection and produce unbiased parameters which can be used to calculate unbiased imputed earnings. The sample selection correction procedure consists of entering a variable in the earnings regression which takes the form $f(bX/e)/F(bX/e)$ for those who attended college and $-f(bX/e)/[1-F(bX/e)]$ for those who did not attend college, where b is the estimated vector of coefficients from the reduced form probit, X is the vector of personal descriptors included in the reduced form probit, e is the variance of the error term from the reduced form probit (arbitrarily set equal to one), f and F are, respectively, the probability density function and cumulative density function of the normal distribution. This procedure is due to Heckman (1979). The unbiased imputed earnings, along with individual's observed earnings and those family background characteristics which influence the discount rate, are included as independent variables in a second, structural probit equation. When, Willis and Rosen (1979) adopted the two-stage procedure described above they found evidence of sample selection along the lines suggested above, i.e.

self-selection on the basis of comparative advantage.

The lack of the necessary wage data meant that only the reduced form probit could be estimated here. Although this means that the effect, on school leaver's decisions, of the earnings differential between those who continued in full-time tertiary education and those who did not cannot be examined, it also means that observed ability characteristics are not restricted to operate via earnings alone and, also, it is still true that the resulting estimates are of interest in themselves. (Micklewright, 1987)

Appendix 7.3

The Maximum Likelihood Model Fitting Procedure

The likelihood-ratio test operates in the following manner. Consider a population that consists of two identifiable groups who are believed to differ with regard to the way in which the process of interest operates. One formulates the equation to be estimated and performs two estimation runs. The first run consists of estimating, using maximum likelihood methods, the equation on the data relating to both groups taken together:

(A7.1) prob(yik=1) = BXijk + Ei, E ~ N(0,σ_E^2)

where:

yi = State of interest indicated by 0,1 for individual i

B = Vector of parameters including the constant

Xij = Vector of explanatory variables j

k = group, k=1,2

Equation (A7.1) is called "the constrained equation", since it constrains all the estimated parameters (including the constant) to be the same for individuals from both groups.

The second run consists of estimating the following equation, again using maximum likelihood methods:

(A7.2) Prob(yik=1) = BXijk + DXij + Ei

where:

D = 1 if k = 1

D = 0 if k = 2

Equation (A7.2) is called the "unconstrained equation" since, by use of the group indicating dummy variable D, it allows all of the estimated parameters,

including the constant, to differ between the two groups. Each of the estimated D coefficients shows the extent to which the value of that particular parameter differs between the two groups, and whether this difference is significant or not.

In order to test whether the D coefficients taken as a group are significant or not, one uses the log likelihood statistics from the two equations to estimate the test-statistic (Maddala, 1977):

(A7.3) -2(log likelihood statistic for the constrained equation - log likelihood statistic for the unconstrained equation).

This statistic is asymptotically distributed as chi-squared with as many degrees of freedom as there are parameters in the constrained equation (including the constant).

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